The Builder.

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ILLUSTRATIONS.

New Vicarage, Forest-gate, Essex (with Plans).—Mr. George M'Donell, Architect 1304
International Exhibition Building, Melbourne.—Selected Design, by Messrs. Reed & Barnes, Architects 1305

CONTENTS.

The Outlook of Labour for the Winter, and the Shortest Road to Ruin 1291
"Robert Dick, Baker, of Thurso" 1292
Institute of Painters in Water Colours 1293
The Legal Relation of Quantity Surveyors to Architects, Builders, and Owners 1294
Canova's Country 1295
A New Art Project 1296
Rock-Boring Machinery in Cornwall 1296
Roman Remains, Lincoln 1296
The Organ and its Treatment 1297
Roman Military Road through Durham to North Wales: British Archæological Association 1299
Mr. Crace's Views and Maps of Old London 1309
Royal Academy 1300
Suburban Streets and Pavements 1301
Sewage and Irrigation Works in Germany 1301
Architecture in America 1302
Additional Waterworks, Vienna 1302
New Vicarage, Forest Gate 1302
Accepted Design for the International Exhibition Building, Melbourne 1302
The High Sanctuary at Jerusalem 1307
Architectural Association 1309
New Building Bye Laws for London, under 41 & 42 Vict. Ch. 32 1310
Sewage Treatment at Hertford 1311
A National Theatre not wholly controlled by the Prevailing Taste 1311
The Restoration of Ancient Buildings 1312
A New Guard-House at the Tower 1312
Manchester City Surveyor 1312
"About Etching" 1313
Costless Power for the Electric Light 1313
A New Town-Hall at Hove 1313
Blackballing at the Architectural Association 1313
Strength of Stone 1313
Concrete Roofs 1313
A Yard of Ballast 1314
Town Clerks and Borough Surveyors 1314
Work done during Bankruptcy: Jameson & Co. *v.* The Brick and Stone Company, Limited 1314
Prevention of Water-Waste 1314
Southport 1314
Compensation Case: The South-Western Railway Company and the Wimbledon Local Board, Sewage Farm 1314
Accidents 1314
Variorum 1314
Miscellanea 13.5

The Outlook of Labour for the Winter and the Shortest Road to Ruin.

THE gloom of the season is anything but lightened by the news that comes from South Wales. How far the actual condition of the Welsh collieries may be due to the start which the long coal-war of 1875 enabled the northern coal-owners to obtain in the market may be a matter of doubt. But unfortunately there is no doubt at all that the Welsh coal trade at the present time is in a state of such depression as to render its continuance extremely precarious. The northern coal-pits, according to statements made at a meeting of the Monmouthshire and South Wales Colliery Association held in Cardiff in the last week of November, have recently effected a further reduction in wages, making a total abatement of 22½ per cent. on the rate paid in 1869. The owners' representatives on the Sliding Scale Committee have come to the resolution that unless the minimum wage arrangement be put an end to, and the working hours restored to sixty per week, it will be impossible to keep the Welsh collieries open, even at a reduced rate of wages. Failing the assent of the workmen to this proposal, the owners see no alternative but to give, on December 31, the requisite six months' notice to put an end to the sliding scale agreement.

It is disheartening to find from this intelligence that in a region which has already suffered so much from the results of an ill-advised labour war, the worst does not yet seem to be over. At present, indeed, we have no indications of that embittered feeling between the owners and the workmen which was one of the most regrettable features of the great strike of 1875. In the presence of great calamities minor enmities are forgotten. Misery makes men acquainted with strange bedfellows. The depressed condition of the Welsh coal trade must be too indisputable to allow of any suggestion that sales are to be commanded by diminished out-put, or by shortened hours. Men, as well as masters, are being taught by a stern and sorrowful experience that the attempt to increase sales by limiting produce, or to raise the market price by working in the most expensive manner, must necessarily prove a disastrous failure. The only consolation to be drawn from the actual distress is the hope that in other trades and crafts the bitter lesson may be intelligently laid to heart.

It must be unnecessary, at the present time, to make any very lengthened remarks as to the sympathy felt by the *Builder* for the working classes, or as to our hearty concurrence in any effort for their elevation in the social scale. The only points on which we have before now joined issue with certain advisers of the working men have been as to what are the proper steps to arrive at that end. The two points which have been adopted as maxims, and placed as the great objects to be accomplished by the powerful machinery of trade organisations, have been the advance of wages and the reduction of hours. And at all critical periods of the labour dispute, the question of time has been preferred to that of pay. In fact, the cotton-spinners, the last of the trades whose contention with their employers has attracted public regard, have given the most distinct proof of the earnestness with which they have held the current opinion of their class, by agreeing to reduce wages, if accompanied by reduced time. Thus, it is true, the artisan would doubly suffer. He would burn the candle at both ends. But, so firm was his belief that over-production was the main cause of the absence of demand, that he was willing to back this view of political economics at a loss (which he hoped would be only temporary) of 40 per cent. of his weekly earnings, if the mills stopped for two days in the week; rather than submit to the simple deduction of one-tenth, without any change in the hours of working.

We doubt whether this question of short-time has ever yet been conclusively placed in the clear light of day. At a moment when the colliers in the North have found themselves forced to return to sixty hours of work per week, and when, by so doing, they have so far rolled back the tide of prosperity which had ebbed from their district towards Wales, that in Wales the need of following this example is becoming apparent, it is desirable to look a little closely at this part of the subject.

Mr. Howell has told us, very recently, that the advisers of the trade unions attached more importance to the shortening of the hours of labour than to any advance of pay, and that for the reason that it was certain that wages would hereafter fluctuate according to the activity of trade; but that short time, once established, would be permanent. In one great industry we see that this forecast has proved incorrect. It follows that there must be a law regulating the hours of work, which is not altogether subordinate to the will of the workman.

Efforts have been, until very recently, constant and persistent for the reduction of the length of the working day. The miners have generally established a day of eight hours; and it is among the miners, as we see, that the return to a day of ten hours has first proved to be necessary. The engineers, masons, and other trades, have repeatedly agitated for a like reduction. This idea has filled the imagination of the workmen. At their anniversary dinners, bean-feasts, club feasts, and drinking bouts, when they have the opportunity of indulging in such recreations, the one toast which is most enthusiastically received,—we give it on the unexceptionable authority of Mr. Howell,—is "The Four Eights." The meaning of that somewhat enigmatical phrase is this,—eight hours' work, eight hours' play, eight hours' rest, and eight shillings a day. Golden times, indeed, they would be for old England. But the question is,—how to attain them. Or, indeed, there is a yet more urgent question, and that is,—how far are the four eights mutually consistent? Is it possible to advance towards them altogether? Or are they in any way mutually exclusive? Is the eight hours' play, for instance, practically consistent with the eight shillings a day?

Let us take the case of a model workman, skilful, sober, industrious, provident; who, with every prospect of long life to look forward to, and a large family to maintain, has the means of choosing how many hours in the day he will work. Let it be, for instance, a journeyman who works at home, and who is paid by the piece, or by the actual quantity of work which he takes to his employer completed. Such a man, after a little preliminary experience, will settle down to that rate and duration of work which he finds on the whole the most expedient. The wages will form one limit, the power of endurance another. He will strike the balance between the two. And, if he can choose, he will ultimately work as many hours on the average in a week as he finds that he can do without over-fatigue,—his incentive being the greater amount of money that he will receive on the Saturday night. And if he be the father of a family it is pretty sure that forty-eight hours in the week will not be the limit of his industry.

As it is with the individual workman, so it is with the trade of which he is a member; so it is with the country in which the trades are elements of productive power. As a general rule, the more a man, an association, or a country can produce, the richer it must be. As to that there can be no dispute. The application of industry to the products of nature is the source of all wealth. Gold has to be found to be dug, to be washed, to be melted. The labour expended in the obtaining of the metal is the measure, sooner or later, of the exchangeable value of gold. Coal has to be mined and brought to market. Wheat has to be sown, to be watched, to be reaped, to be garnered, and to be thrashed. The wealth of a country consists of the products of industry; and the more steady and enlightened the industry, the greater the wealth.

It is, of course, possible that the industry of a nation may be unduly distributed. Thus if, instead of two men devoting their time to the production of cotton fabrics, and one to that of fabrics of silk, all three work for cotton, too much cotton and too little silk may be the result. But the remedy is, not to make the three men each work for only two-thirds of his time, but to send the third man back again to his silk works. And this, though a simple illustration, underlies the whole affair. Com-

paratively there may be an over-production. In one item or in several items, too much, relatively speaking, may be produced,—as if a farmer should grow all barley and no wheat, or all turnips and no hay. In such case there is an error in the distribution of labour. But, as far as the country as a whole is concerned, there need be no such thing as over-production. There may be, and perhaps often is, an ill-regulated and disproportionate production. But while few men are found to admit that they are either too successful or too industrious, it is certain that a country cannot be too productive.

The main difference, in this case, between the man and the country, the part and the whole, lies here. The man must have a certain time for rest, and it will be well if he has also a certain time for recreation, and especially for that kind of education which, in all of us but those who emulate the lot of lower animals, goes on, for good or for evil, through the greater part of life. The country requires no such break in the energy of production. The corn grows by night, or, at all events, by early dawn, as well as by day. All the addition that nature makes to her store of national wealth is steady in its increase. And while human nerve, and brain, and muscle demand alternatives of rest and of activity, one great army of mechanical motors, amounting, at least, to a power of from fifteen to twenty millions of horses, ask only for coal and for water to keep up an untiring duty.

It is impossible to keep too distinctly before the attention the fact that the present century (together with a few closing years of the past) has witnessed the introduction of an entirely new element into the field of labour. The adaptation of mechanical motor power long since made, and that to the great advantage of mankind, by windmills and by watermills, has reached its present development by the improvement of the steam-engine. A man may now obtain a mechanical motor, exerting the power of a horse, for the price of a horse. If he be able to employ 100 horses he can obtain 100-horse power in steam-engines at a much lower price than he would pay for 100 horses. And the animals will only last a few years,—eight or ten at the outside. They must be regularly fed, work or no work; they must rest for at least sixteen hours out of the twenty-four. Take what pains we will, we cannot obtain a horse-power from a horse at much less than fourpence an hour, taking into account the cost for twenty-four hours, and the work done in eight hours, or fewer.

For the mechanical horse-power, on the contrary, which becomes cheaper the larger the quantity in which it is employed, a cost of a penny per working hour is the outside for a small engine. For a large one a halfpenny, or less, per hour per horse-power will cover all expense. And then the steam-horse never tires. Instead of one rider being able to tire out three horses or more in a day, one steam-horse will work steadily on so as to employ the successive care of three drivers in the twenty-four hours, if each work for only eight hours. And the steam-horse eats only in exact proportion to the work he does. He costs, as matter of interest of money and depreciation, less than half the cost of the animal, per annum or per week. And as to provender, he consumes only the exact quantity which he converts into work. For all exertion of power in a continuous groove, then, the productive energy which is added to the resources of a nation by the discovery and application of the mechanical theory of heat is practically illimitable.

It is obvious that as far as regards the productive power of the nation, the chief problem is how to dispose the services of some 6,000,000 or 7,000,000 of working folk as to make the most of the duty of 15,000,000, 20,000,000, or any greater number of mechanical horse-powers. In many cases, *i.e.*, such as mines, smelting furnaces, mills, and the like, it is evident how this best can be done. Supposing that the cost of the mechanical power, including the rent and maintenance of houses, factories, mills, engines, machinery, interest on the money locked up in them, and sinking-fund to replace the depreciation of the plant in use, be equal to that of the human power,—which is in many instances the rule. Fifty pounds spent in wages, plus fifty pounds found in this way by the employer, will produce work of the cost price of 100*l.* But if the arrangements be so made that, instead of 100 men working for forty-eight hours a week, 50 men work for the same time, and a second 50 men for a second forty-eight hours in the same week, what is the result? Roughly speaking, the work which cost 100*l.* in the first instance will be produced for 75*l.* in the second. For, on the one hand, either the product will be doubled, because the time for which the mechanical power is employed in the work is doubled; or, on the other hand, the employer's cost will be halved. Machinery of any kind that is requisite for the employment of fifty men will be only half that required for the employment of a hundred men. Thus the owner will have to pay 25*l.* (*plus* some small addition for extra coal and light) for machinery, and 50*l.*, in two sums of 25*l.* each, for wages. For this 75*l.* (and a little more) he will turn out work which, at the old rate of wages, will still be worth 100*l.* There is thus created a margin of profit of 25*l.* out of the 100*l.* It will be possible to lower the market price eight per cent., to pay eight per cent. higher wages, and yet to put nine per cent. more in the pocket of the employer. And if, as has sometimes been the case when work is urgent, and as is always convenient in mines, three shifts of men are employed in the twenty-four hours, a third, instead of a fourth of the original cost will be saved. The only correction to be made, on paper, to this calculation, is that of the price of coals and other like materials. If we include those in the sum allowed for wages, the reduction in the cost of production will be directly proportionate to the increase in the number of hours, out of the twenty-four, for which the machinery is kept in motion. In very many cases the amount paid for wages is less than half the total cost given; and in such cases the economical inducement,—as regards the interest of all concerned,—to work long time is the more palpable.

Whether, then, we regard the power of commanding the market by abatement of price, the creation of a margin which will allow of an increase of wages, or the remuneration of the employer, we find that the first requisite is to keep the machinery running for as long a time as possible, and thus to get the most out of the mechanical power. But to gain the full advantage this long time must be normal. Thus, if a master whose machinery cost 50*l.* per day, and whose wages are 50*l.* per day, works double tides for three months, he only obtains half the advantages that would result from steadily working all the year round in double sets. For either he doubles his output, which may disturb the market; or he has machinery at work doing only half that which it could do if properly manned. The expenditure, in the first case, will be 150*l.*; the product will be worth 200*l.* But while there was a sale for 100*l.* worth of goods, there may not be a sale for 200*l.* worth of goods. So far, no doubt, the workers are justified in their complaints as to over-production. Doing double work by spurts is liable to this objection. If, on the other hand, the employer can calculate that his men will aid him, for the common advantage, in making the most of his mechanical appliances, he will restrict his outlay in the first instance, and thus, as before shown, produce his 100*l.* worth of output for 75*l.*

We do not, of course, for a moment imply that it is in the power of the producers of labour, by a sudden accord as to the above indisputable facts, at once to reduce the cost price of production by 25 per cent. A very great, and possibly a very wasteful, expenditure has been already incurred for the service of the work-people, who have insisted on short time. Only slowly, even in the event of so salutary a revolution in the views of the working men as logic would indicate to be desirable, could the loss thus caused be made up. Loss, that is to say, not absolute, but relative. It can hardly be called an absolute loss to the country, in the first place, to have two cotton-mills made to do the work of one. But it is a loss of the economical value of the silk-mill, or the irrigation, or the harbour, or something else which might have been erected for the cost of the duplicate cotton-mill. It is only by the conversion of factories and machinery to objects for which there is a demand, or by the steady increase of trade, that the machinery now existing can be made to pay as it ought to pay.

But what we are anxious to show is the tendency of long or short time. If we take the extreme cases,—of a mine that is worked for twenty-four hours per day for six days in the week, and of a factory which has been put on short time, working four days out of six, we have two outside limits, between which almost every arrangement as to time can be included. In the first instance, allowing 25*l.* for master's cost and three sums of 25*l.* each for wages, we have a production of 150 for a cost of 100, where we should only have had a production of 50 by working for eight hours at a cost of 50. We have thus secured a profit of 50 per cent. *over* any profit gained by working for one shift per day. And if it be not by increasing production but by diminishing outlay, both of capital and of wages, that the result is obtained, the proportion will be the same. In the other case,—supposing that to work for sixty hours in a week costs 60*l.* in labour and 60*l.* in plant and machinery, giving a cost price of 120; to reduce the working time to forty hours will reduce the cost price to 100; but it will reduce the outcome, taking its value as before, to 80*l.* There is thus a net loss to the country of 20 per cent. incurred by the loss of 40 per cent. in time. Nor is there any reason to object to the general statement that whatever reduction is made in the working hours is a loss, to the trades involved in the reduction, of an amount equal to at least half that of the wages reduced. To the country, indeed, the loss is that of the entire production which might have gone on in the idle time. But the loss of which we speak is not gross, but net; it is the loss of a profit which might have been divided fairly between customers and producers.

Unless some unexpected hole can be picked in this argument, it is thus demonstrated that the short-time policy is a suicidal policy. In trying to put asunder what nature has joined together, stored-up appliance and manual labour, the workman has been equally injuring his master and himself. As far as the nation is concerned he has thus inflicted a double injury. Nor is it to be for a moment supposed that by the production of a smaller quantity of commodities, at an enhanced price,—which is the logical outcome of short time,—the market can have a turn given to it. So long as any monopoly of production exists such may be the case. But of what have we a monopoly of production? Not of coal, of which our collieries form about 4 per cent of the known coalfields of the world. Not of textile fabrics, of which we have to import the raw materials, and by the export of the best machinery for making which at least one great house at Oldham has become rich. Not of iron, in which Belgium, Germany, France, and America are our rivals, and sometimes, even now, our successful rivals. We have, if we make the best of our appliances, a fair start in the market of the world. But we have no advantages to throw away. The stern logic of fact is teaching this wholesome truth to our colliers. It will, disastrously not only for themselves, but for us all, teach the same to other trades and crafts, unless the men, before it be too late, will look simple truth in the face, and learn that short time means a short road to ruin.

"ROBERT DICK, BAKER, OF THURSO."

We confess that when we heard that the author of the life of Edward, the naturalist, of Banff, had "picked up" another specimen of a self-taught Highland man of science to biographise, we were under some little fear lest the repetition of such a literary enterprise should prove to be rather perfunctory work, done at the instance of those expecting people, the publishers, who always want to have a successful venture repeated in some form or other. But the result is much and happily otherwise. The hero of the new biography* is no man of straw, furbished up for literary purposes. Robert Dick was a remarkable, we might say in not a few respects a great man, and was recognised as such a good many years ago among leaders of geological science; a kind of fame, however, which takes a good while to permeate society, more especially when, as in this case, the modest worker made it a request often to those who made use of his labour, that his name might not be mentioned. In one respect his wish seems to have been only too well attended to, from the fact, to which Mr. Smiles calls particular attention, that not a word is said about him in the life of Hugh Miller, although they had been close friends and correspondents for years, and Dick had supplied Miller with much valuable information and equally valuable geological specimens, and had, as Miller said once on a public occasion, robbed himself to furnish his more renowned friend.

* Robert Dick, Baker, of Thurso, Geologist and Botanist. By Samuel Smiles, LL.D. London: John Murray. 1878.

This fact would furnish, in itself, an excuse for a biography of Dick; but the man himself is sufficient excuse.

Robert Dick was a native of a small place named Tullibody, in Clackmannanshire, but spent the greater part of his life at Thurso, on the north coast of Caithness, where he commenced his occupation of a baker on his own account, when about twenty years of age. It is subsequently to this period that the chief interest of his life begins. In regard to his boyish days, there is a certain similarity between his character and that of Edward of Banff, in so far as that he was very early addicted to the study of nature in the course of long rambles of his own choosing, and that he suffered considerable family and neighbourly persecution in consequence, and with just as little effect in modifying his tastes. There is also, in a general way, sufficient similarity between his life and that of the Banff naturalist to lead one to some curious considerations as to whether there is anything in the influence of manners or scenery, or both, in the North of Scotland, tending to evolve self-taught genius among the humbly-born class of people. Burns, of course in a different way, is an example of the same phenomenon. In regard to the natural history study, one can imagine how the influences might be traced. Given a man of active mind and great physical endurance, and with the persevering energy characteristic of the typical Scotchman, put him down to a wearisome and uninteresting trade, and give him no pleasures of society, or of what are generally called amusements, and it is rather to be expected that he should take to nature as an outlet for his mind, the more so if he live near a seacoast with all its records of change and its opportunities of studying the working of great physical forces. But the similarity between these two men, of whom Mr. Smiles has written, is only in a general way in regard to the nature of their career, their perseverance, and physical endurance, and we may add the rather melancholy fact that each fell into poverty and difficulty towards the close of his days, and had to sell a large part of his collected treasures. But the men were very different, and, on the whole, we are inclined to think Edward was the more remarkable character of the two, partly, perhaps, in consequence of some deficiencies from which the other did not suffer so much: for Edward had nothing to call "taste" or cultivation, and it was by the sheer force of an over-mastering and passionate enthusiasm for "beasties" and for knowing all their ways that he was led to toil after them through all obstacles, and make himself an authority on them in spite of every disadvantage. The discouragements against which Dick had to struggle were not so great, nor was his enthusiasm so extraordinary and overpowering, for the reason that he had more outlets to his mind: he seems to have been by nature a man of more refined tastes, though his original station in life was much the same as that of Edward: he writes and expresses himself like a man of literary cultivation, he wrote verse which was more than passable, he could draw with considerable ability and had a great taste for art, and took an enlightened interest in such topics of intellectual controversy as Darwinism and Colenso-ism. This, perhaps, looks like saying the reverse of what we have implied in regard to the relative interest of the two men; but, to our thinking, the untaught and almost fierce enthusiasm of Edward has something wilder and even more unusual about it.

The achievements of Robert Dick, however, were extraordinary enough. His life was that of a small baker in a small coast town, working with his own hands entirely, and obliged to be up at very early and regular hours in the pursuit of his work, to which he attended most religiously and, it is said, ably, though there seems some reason to think that he lost business in the latter part of his life, indirectly through his scientific studies, as the stupid neighbours could not believe that a man who had other pursuits beyond their comprehension could be attending properly to his baking. In spite, however, of really most regular attention to work, he contrived to get time to walk all over the desolate Caithness country, to know all its botany, all its geological features, and to discover many fossils of the greatest value to geologists and palæontologists, and which gave the foundation for important modifications in the theories of such men as Hugh Miller and Murchison, who, in fact, made use of what Dick had discovered for them, and which they might never have discovered for themselves. This was not without the most ample and public acknowledgment on the part, at all events, of Murchison, who paid an enthusiastic tribute to Dick at the Leeds meeting of the British Association in 1858, concluding his remarks by observing that he had brought before his audience this account of what had been done by a man with so few advantages, in order that they "might deduce a practical application" from the story. This is the more to the credit of Murchison, as he has been accused, perhaps not quite without cause, of having been himself a little too much of a "gentleman-geologist," a character abhorrent to Dick, who seems to have been never tired of sarcasms against geologists who went about the country "in gigs," and who visited, as he averred, scenes rich in specimens, and returned empty,—"and why? For this simple reason, that they were afraid to 'fyle'* their trousers!" The latter criticism one has every sympathy with, of course; but as to the heinous sin of the gigs, Dick did not, probably, realise that all men were not possessed of his powers of speed and endurance on foot. However, Murchison, at all events, seems to have thoroughly appreciated Robert Dick, and the account of the first meeting of the baker and the baronet is one of the pleasantest and most characteristic passages in the book. The meeting took place in the bakehouse, in front of the oven, for Dick would not (in fact, could not) leave his "daily bread" to talk even to geologists; and Sir Roderick, in speaking of the dip of certain rocks in Caithness, complained of the want of a sufficient map of the county. Dick readily responded that the existing maps of the county were, on his experience, "all bosh," but he thought he could make Sir Roderick a map, which he proceeded to do on the spot by making a model in relief with flour on a baking-board, in such a manner as to show in relief all the geological structures of Caithness,—"the dislocations and fractures, the watersheds and the drainage, and in fact an outline of the entire geography of the county." The power of thus illustrating his knowledge *extempore* is, as our readers will admit, nearly as remarkable as the knowledge itself. In half acknowledgment of Murchison's speech at Leeds, Dick wrote a ballad which got into the papers under the name of "The Geologist's Song," and was so much liked as to be sung at one of the club dinners at which the scientific lions occasionally indulge in "high jinks"; they are really easy and pointed verses, with a touch of humour like that of Burns, and a burden of—

"Hammers an' chisels an' a'
Chisels an' fossils an' a'."

He did not, however, like Murchison speaking so publicly of him, as it brought lion-hunters down upon him, with whom he had no patience, and, in fact, would seldom see them, were they gentle or simple. He was no respecter of persons, and even the Duke of Argyll,—"the lord their god his Grace," as Burns called the Duke of his own day,—found that when he was late in an appointment he had made to see Dick's collection, the busy worker, expecting people to keep time in their appointments, had only waited till the time fixed upon, and then at once had gone out on one of his fossil-hunts, merely leaving a message that the things were on the table upstairs if the visitor came. Indeed, Mr. Dick seems to us to have been not only a genius, but to have shown the feelings of a high-minded gentleman, spite of his humble occupation and surroundings, in his sensitive dislike to publicity, and his proud contempt for visitors who intruded on him out of idle curiosity. A trait of gentle feeling is mentioned on page 287; when Lady Sinclair proposed to become his customer, he only said he should be the last person to take the bread from the mouth of another, and that he was sure she was admirably served by her present baker. How many of our great tradesmen, rolling in money, or even, alas! of our professional men, would show the like magnanimity? And it was not that he did not bitterly feel the plague of want of money when it came upon him, either. To a friend who praised his "independence" under adverse circumstances, he answered that it was very good to credit him with independence of feeling, but for all that he had been at work among flour-sacks for over thirty years, and he "never yet knew an empty sack stand upright." What a spirit of sad and shrewd sarcasm in that!

Robert Dick was a noble, gifted, and interesting man, and we are indebted to Mr. Smiles for introducing us to him. In other ways the book is a very pleasant one, from the number of beautiful illustrations of the scenery about Caithness; and the description of that wild and grand coast is so vivid, and in a certain sense enticing, that we should not wonder if the effect of the book were to draw some more visitors than usual into that bleak corner of Scotland, where there must be much that is grand in coast scenery and effect to be enjoyed, though not such, perhaps, as would best suit people "in gigs."

* Anglicè, "defile."

INSTITUTE OF PAINTERS IN WATER-COLOURS.

THE thirteenth Winter Exhibition of this Society is, much more than usual, what these Winter Exhibitions originally professed to be, exhibitions of sketches and studies rather than of finished drawings. We have always urged that it was desirable to keep to this professed object *bonâ fide*, seeing that the sketch stage of a work of art, or the sketch from nature which is made as a sketch, and with no ulterior end, has an interest of its own quite different from that of the finished drawing, and that thus a different character is given to the Winter Exhibition, and it avoids becoming a mere repetition of the Summer one. As a sketch exhibition the present one strikes us as of unusual interest and excellence, and there are some good works by names that seem comparatively new or unaccustomed to our eyes in the catalogue of the Institute.

Figure studies are not numerous. Mr. J. D. Linton, who naturally claims the first notice in regard to this branch of the art, is not, however, "in first force" this year; his most prominent work, "A Cup of Tea" (75), an interior sketch with a figure of a placid and very buxom brunette in modern costume, though showing very fine qualities of colour and drawing, is almost entirely destitute of the sentiment which is usually the leading interest in the works of this artist, even above his splendid qualities of technique. A slighter sketch of a "Fisher Girl" (37) has more of personal character in it, and interests us besides as showing the artist in a style of subject unusual with him. In short, Mr. Linton is realistic this season instead of poetic. Mr. Seymour Lucas, whose reputation seems steadily rising, sends two fine broadly-executed studies of "A Royalist" and "A Puritan" (9, 289), of which the latter is by far the more forcible both in composition and in character; the Royalist is not an attractive-looking gentleman, but the artist has avoided the common temptation to make him theatrical. Mr. Guido Bach's "Poultry-seller, Cairo" (26), is an effective sketch, far more attractive to us than most of his finished drawings. We next come across Mr. C. Green, whose "*Tête-à-tête*" (21) carries us back very characteristically to the days of Jane Austen. Other sketches by the same artist are worthy of great admiration, and superior to this: one especially, "A Chasseur of the First Empire" (322) on one of the screens; indeed, we have rarely seen this artist better represented in an exhibition. Mr. Hugh Carter, whom we have several times before recognised as an artist sitting at the feet of Israels, has a fine and rather pathetic study on a larger scale than usual, of "A Dutch Woman" (127), an aged and frail-looking person with a sadly resigned expression of countenance. We hardly understand why Mr. Poole painted and sent his study of "A Cottage Girl" (151): it is not worthy of his reputation; he exhibits also the water-colour study for his picture of the "Cave of Mammon," which is very welcome indeed, and in some respects strikes us as finer than the large painting (speaking of the latter from memory only). We next notice the largest figure subject in the place, and one which is quite a finished drawing, Mr. Towneley Green's "Actors in an Inn Yard" (197), representing a performance on an extempore stage in the courtyard of a "hostelry." This is in many respects an exceedingly interesting work in composition, colour, and, feeling; it is perhaps finished with a care and subtlety in regard to colour combinations, and a degree of smoothed-out finish in regard to execution, which detracts from its reality, and makes us feel too distinctly that it is a picture only and not a scene in actual human life; but the various degrees of interest shown by the spectators are very well and minutely discriminated, although the whole of them seem too uniformly placid and quiet in their mien and manner. The principal actor

looks as if he were intended to be bombastic, but he again is hardly sufficiently so, and looks rather as if playing or acting; his subordinate, the valet or serving-man of the piece, is much more lifelike in manner, and there is some able drawing shown in the figure. Altogether, the work is one to be looked on with interest and respect, though nothing in it excites our sympathies very much. A kindred subject is that by Mr. C. Cattermole, "Hamlet and the Players" (214), which may be instructively compared with the previously-named work. Mr. Cattermole is neither so refined in execution nor so agreeable in colour, nor is his Hamlet very successful as a Hamlet, but the group of players listening with varied expressions of criticism or respect have something about them more distinctly human and dramatic than the placid and dream-like figures of Mr. Green. Two or three studies of heads by Mr. Gregory have force and power; and there is something, but not so much, in the pretty but rather affected studies of Mr. E. Bale. Mr. Herkomer's large and very ugly unfinished drawing, called "A Phrenologist" (273) derives considerable force and piquancy from the expression imparted to the skill which the *savant* holds in his hand, and which appears to grin sardonically at him. On the screen are some of the admirable *Punch* drawings of Mr. Tenniel, and Mr. Linton's sketch (a very fine and bold one) for "The Flag of Truce," and, last but not least, a small Israels, "Grace before Meat" (307), full of fine effect and expressive pathos.

In landscape there are a great many charming small sketches. Mr. Hine contributes a great number, all of them purely sketches which might have been (and probably were) finished on the spot, and some of which are in illustration of subjects not usually handled by him. Two of the best of these are the bridge leading to the "Back of St. John's College, Cambridge" (116), with part of the college buildings, and still better, the "Fisherman's Refuge, Yarmouth" (41), a most unusual and quaintly picturesque brick building, admirably rendered in all its old-world character, without any labour or over-finish. There is a study, too, "On the South Coast" (202), of a set of coasting craft on the beach, with their big red sails hung out to dry; and another of "New Barns, St. Alban's" (203), and one on the second screen, representing the artist's favourite type of subject, "On the Downs near Lewes" (319), which is beautiful. Mr. W. Small's "Summer-time" (51) may count either among landscape or figure subjects, and is good from either point of view, and notable for the free handling both of figures and landscape and their successful combination. Mr. Fulleylove is accurate and topographical, and at the same time artistic (no easy feat) in representations of scenes in which buildings pay an important part. "Lincoln's-inn-fields" (10) is one, and a better one is "Tabley Old Hall, Cheshire," a dear old haunted-looking house, with a garden gay in the foreground with great rank poppies. A number of mostly small sketches represent Mr. Wimperis, one of the best and most thoroughly true water-colour artists who exhibits here; of these, "Waste Land" (257) seems to us far the most powerful, though, perhaps, the little drawing, "A Passing Storm" (324), on one of the screens, is inferior to it only in being smaller and slighter. Mr. Pidgeon's "Inner Harbour, Shoreham" (25) painted on the spot, is an admirable little work under those conditions, and a small sketch by Mr. Aumonier, "March" (59), a bank of red ploughed field, with thin, bare trees on the top of the ridge against a peculiarly delicate and tender sky, is a very characteristic little bit of poetic painting. Mr. T. Collier, who has in several recent exhibitions of the Institute been *facile princeps* in regard to landscape, contributes a powerful but rather rough sketch called "A June Morning" (71) which hardly shows his finest characteristics; there are finer qualities in two small sketches on the screen (309). Mr. E. Hargitt's works are exceptionally good, especially "The Hay Wagon" (85), which is, in fact, an extended landscape with a remarkably fine sky, and "The Skirts of Dartmoor" (146); we cannot but think that his work has higher artistic results than are realised in many of his more highly-finished drawings, which have less power than these sketches and show a less pure water-colour style. Mr. Orrock's studies on the Lincolnshire coast,—flat, sandy landscapes with a great expanse of sky, are very noteworthy for their truth of tone and aërial effect and a certain originality of sentiment and handling. Two studies by Mr. Beavis, at Hastings and Harwich (159, 184), are very successful as out-door studies, particularly in this respect, that they combine freedom of execution and a decisively "out-door" feeling with great precision in the indication of detail in the middle distance; notice in regard to this the "Harwich" especially, where the buildings and general character of the town seen across the meadows are so well rendered as to produce the exactitude of effect of a finished drawing, though, in fact, the work is slight enough in manipulation. Mr. Maplestone has a style of his own; the best of his drawings is "Watford" (246); it may possibly err in the direction of deficiency of precision in indicating local colour and detail, but there can be no question of its fine qualities in regard to the sentiment of landscape. Among drawings dealing with architectural subjects (among which there are a good many that are not very good) may be mentioned Mr. Carl Werner's two fine studies of the Erechtheum and the Propylæa at Athens; and in another way a small drawing by Mr. L. Haghe, of the "Kitchen of the Convent of St. Onofrio, Rome" (210), is interesting as showing what material for really picturesque effect can be got out of such prosaic details as frying-pans and other metal utensils of the cooking department.

Altogether, this is one of the most satisfactory exhibitions we have seen lately at the Institute rooms, not the less because the best of the contributions keep to their professed character of "sketches and studies."

THE LEGAL RELATION OF QUANTITY SURVEYORS TO ARCHITECTS, BUILDERS, AND OWNERS.

Our readers are aware that some correspondence has recently been published in our columns in regard to the law as to quantities. The subject is undoubtedly one not only of interest to those who are professionally concerned in the erection of buildings, but of much practical importance. One of the chief reasons which are given for the establishment of a code of English law is that it should make plain to laymen, so far as is possible, the main propositions of law. When we consider the uncertainty which clearly exists in our readers' minds in regard to the law as to quantities, we regret that we cannot present them with a page from an English code which should set their doubts on this point at rest. The letter of Messrs. Harston, which we published in our issue of November 23rd, seemed to us to set out by no means incorrectly the general impressions as to the law of quantities. Still, having, as we have said, no code to refer to, or with which to compare these propositions, we determined to take the opinion of counsel on the matter, so that our readers might, so far as was possible, be correctly informed what is the present state of the law in regard to quantities, for it is in this aspect chiefly a question for a legal mind to determine. We are quite sure that those who are interested in this question will consider this the most satisfactory manner of closing the correspondence which has appeared in our pages, and we therefore without further comment leave the case and opinion to our readers' perusal.

The gentleman to whom the case was sent by our solicitors, Messrs. Bockett & Son, is known to have given special attention to the law connected with building.

Case for the Opinion of Counsel.

Herewith is a letter from Messrs. A. & C. Harston, architects, published in the *Builder* of November 23rd, in which various points connected with the legal relation of quantity surveyors to architects, builders, and house-owners are raised. The editor of the *Builder* is desirous of obtaining a legal opinion on the matter, for publication, if desired. Counsel will, therefore, please to give his opinion as to

(1.) Who is responsible to the quantity surveyor for the costs of taking out the quantities, firstly, when no tender is made by a builder, or he is prevented from continuing a work undertaken; and, secondly, where a builder who has tendered has completed the work. (2.) Generally, on any other points which will make the legal position of the above-mentioned persons clear under the circumstances suggested in the letter sent herewith, as, for instance, when the architect himself takes out the quantities.

Opinion.

1. *Primâ facie* when an architect engages a quantity surveyor to take out the quantities, he will be liable to the surveyor for his charges, unless he states that he is agent for a named principal. But if the surveyor proves an express or implied authority from the person for whom the architect has been doing work to employ a quantity surveyor, then the architect's employer will be liable to the quantity surveyor. That was what happened in the case of Moon *v.* The Guardians of the Witney Union, 3 C. B. 814. But it must be borne in mind that the implied authority arises from the force of a custom of the trade, which must be proved by the person who relies on it. This disposes of the case when no building has been erected, or the owner has prevented its completion.

2. But should the builder execute the works as described in the bill of quantities, then he becomes liable to the surveyor for his charges, provided the latter establishes either a distinct custom of the trade to that effect, or a condition in the contract between the builder and the employer that the builder shall pay the surveyor's charges. But an express agreement between the architect and the builder that in any event the latter shall not be liable for the surveyor's charges, as occurred in Taylor *v.* Walsh, 4 Irish L. R. C. P. 467, would take away the effect of the custom.

3. Assuming, however, that the architect himself takes out the quantities. If he were expressly authorised to do this by his employer there could be no question as to the liability of the latter for the cost of this work. If however, the architect were to take out the quantities without having any agreement to this effect with his employer, it is clear that since there was no contract between them, the employer would be under no obligation in the matter. If, however, the builder made use of the quantities as taken out by the architect, the former would clearly be bound to pay a reasonable remuneration to the architect, not from any custom, but because he had used the work of another person for his own purpose and profit. There would, in fact, be a claim against the builder "for work and labour."

4. As to losses incurred through incorrect bills of quantities. I consider that it is quite clear that the person whom I may call the house-owner is in no case liable for any losses incurred by the builder in consequence of the quantities being incorrect; that is, whether there be a separate quantity surveyor or whether the architect act in this capacity. This is plain from two authorities,—Scrivener *v.* Pask, 18 C.B. N.S. 785, and on appeal 1 L.R.C.P. 715, and Thorn *v.* The Mayor of London, 1 L.R. App. Cases, 120, the latter of which cases was finally a decision of the House of Lords. It was an action by a contractor against his employers for loss incurred through errors in the engineer's plans, on the ground that there was an implied warranty that they were correct.

The reasoning in that case clearly applies to bills of quantities. Lord Cairns said, in delivering judgment,—"If it were to be held that there is, with regard to the specification itself, an implied warranty on the part of the person who invites tenders for the contract, that the work can be done in the way and under the conditions mentioned in the specification, so that he is to be found liable in damages if it is found that it cannot be so done, the consequences would be most alarming. They would be consequences which would go to affect every person who, having employed an architect to prepare a plan for a house, afterwards enters into a contract to have a house built according to that plan. It would go to every case in which work was contracted to be done according to a specification, however unexpected might be the results from that work when it came actually to be executed."

But as between a surveyor and a builder I am inclined to think that there is an implied warranty by the former that he has used ordinary skill and care in compiling the bill of quantities, and that it is reasonably correct. The tendency of the Courts is rather in this direction, as shown in some recent cases, and there is no case to the contrary effect of which I am aware, like Thorn *v.* The Mayor of London, which governs one portion of this question. But it must be borne in mind that express contracts, fraud, and want of evidence, and other circumstances may frequently modify or change the above rules.

Temple, Dec. 4, 1878. E. S. Roscoe.

CANOVA'S COUNTRY.

LIVING in the country where the name of Canova, not only as a great artist, but as a charitable benefactor, is much revered, it is difficult to resist uniting in this esteem, if not with as much warmth, at least with a greatly renewed respect, for an artist whose works have so long been famous. Having recently visited the early home of this favourite sculptor, and seen with what sound good sense he devoted the proceeds of his industrious life to the benefit of his countrymen, it is with no small degree of pleasure that we give in these pages some account of Canova's native place, compared, as his expressed wishes in regard to that native place may be, with those of one of our own famous sculptors, John Gibson, whose wishes have been but only lately carried out in London, in accordance with his last request.

In this picturesque province of Venetia, embroidered thickly with the traditions of art-history, we must not allow our veneration of the great names of the past to lead us to overlook those more modern names which, unconnected with any group, stand by themselves, their country almost ignored by the world at large, which admires, and has long admired, their works.

To such belongs Canova, whose romantic birthplace lies among the picturesque Cadore Hills, their beautiful outline distinctly visible from Venice. At no great distance from the antique town of Asolo,* and situated on the southern slope of Monte Grappa, the last of the chain of Alps which overlook the great Trevisan plain, stretching to the Adriatic Sea, the approach to Possagno, whether from the ivy-walled and historic town of Bassano, or from the deserted mountain hamlet of Asolo, is in the highest degree beautiful: it is no surprise that artistic genius should have been developed in such a cradle. In threading the Via di Caniezza to reach Possagno, one sees almost hidden in the morning mist, half way up the pale blue mountain side, the classic Temple of Possagno, surrounded with picturesque hills and solitary valleys. The village of Caniezza, gathered round its little church on the mountain slope, the pastoral appearance of its meadows shut in by rocks and trees, pictures completely the ideal Alpine hamlet. The Temple of Possagno, the stern Doric columns and simple pediment, bear one, as if on Prince Houssain's magic carpet, to Greece, a contrast singularly impressive in a scene, set, as it is, in the midst of nature's almost untouched effects.

And here is the country of Canova, where his father, honest Pietro, worked for many years, and from under whose roof young Antonio went forth to the world to achieve that fame which he had seen floating before him even when a boy, and with difficulty wielding the mallet and the chisel.

The story of Canova's life is too familiar, and the incidents are of too recent occurrence to permit us to do more than refer to them in these pages. His first journey was to Venice; but it was not here that the models of which he was in search were to be found, and soon we see young Canova leaving Northern Italy for Rome. Here at last, in the museum of the Papal capital, he discovered by study that secret he had so long sought, and fame soon recognised his skill.

Arrived at the pinnacle of his renown, he had not forgotten his native town, and it was at this period that he planned and built the Temple of Possagno, showing in its resemblance to the Parthenon that admiration for the Greek which penetrated everything he attempted. In June of the year 1819 the first stone of this temple was laid by him. He had already painted an altar-piece,—the Deposition of the Cross,—and had returned to his studio at Rome (the same occupied in later years by Gibson), to prepare the metopes, and had, indeed, modelled the group of the Pietà. Each year (in this resembling our own Shakspeare, who annually visited his home at Stratford) he came to Possagno, to superintend the erection of the church. In 1822, returning from his native place, he was struck down at Venice, and there, on October 22nd, he breathed his last, amidst the universally-expressed grief of the whole artistic world.

Born in 1757, he had passed sixty-five years amidst sympathising friends, who had welcomed each work as it came from his hand,—appreciative friends, like the refined and *spirituelle* Isabella Albrizzi, whom Byron, it will be remembered, has called the Madame de Staël of Venice, and the lively society which met at her beautiful villa on the Terraglio.*

Canova's remains, by his request, repose in the beautiful church which he had erected at his birthplace, surrounded by the scenes of his happy youth. At Rome, his second home, in the Campidaglio, a mausoleum was erected to his memory; while Europe herself aided in the monument at S. Maria Gloriosa, in Venice, carried out from the model left by the sculptor for the tomb of Titian, and there was preserved Canova's heart; nor did the little town of Asolo, which had conferred on him his first title of nobility, neglect to honour its countryman, and there may be still seen the cenotaph raised by the Asolanesi to Canova.

But amidst all these public honours to the famous sculptor, the most glorious monument to Canova's memory remains in the noble deeds of benevolence and charity that, during his successful life, he secretly carried out, not alone for Possagno, his native place, but for more than one town in the country round about. The interesting museum at Bassano (which, among other treasures, contains a valuable collection of prints of all periods, and notably some rare examples of English masters) preserves, in addition to some 22,000 autographs of famous men, the gift of Canova, several hundreds of his letters, as yet unpublished, from which may be gathered many particulars of the artist's benevolence and endeavours to alleviate the sufferings of his country when Napoleon's army invaded Italy. "I beg of you," he writes to a friend in 1801,† "to send some means of help to this unhappy land, whose sufferings I grieve over to the utmost. I can assure you that many times in the course of the day I exclaim against him who is the cause of all our misery." In these few lines we see Canova, the simple patriotic citizen who, on the suitable occasion, knew how to speak in behalf of his country to those who occasioned its misery. Canova's reply, when Napoleon proposed to transport to Paris the famous Farnese Hercules, is worthy of record,—"Let your majesty, at least, leave something to our poor Italy. These antique monuments form links in a chain of association which can never be transported either from Naples or Rome." Nor must Canova's influence be forgotten in the eventual restoration to Italy of those "illustrious spoils," the artistic treasures which Napoleon had gathered from the whole of Europe in Paris.

At the foot of the hill-side of Possagno stands Canova's house and the Gypsoteca,—an interesting museum where are preserved numerous models of his works (some 200), his sketches, and his books. In this museum, of which there is an equally interesting annexe in the neighbouring town of Bassano, one is able to judge by comparison, so valuable a means of determining an artist's merit, all Canova's famous works, so varied in their conception, from the Icarus in the first gleam of hope in his imagined discovery to the calm features of Washington displaying to his countrymen the table of the laws, the ægis of their liberty; the grace of the Venus issuing from her bath; the even more familiar Hebe (who, by something in her action and in the flutter of her drapery, recalls a suggestion of Goëthe's, of the beauty for a "pathetic statue" of Eurydice bitten in the heel by a snake as she goes joyfully through the meadows with the flowers she has collected); the figures of the Dansatrice, the Psyche, and the Graces, which have already made the fortunes of more than one generation of Italian cast-sellers; the refined beauty of Eliza Bonaparte, the Slumber of the Nymph, and the Sleeping Venus, with its tradition of the model having been the beautiful Princess Pauline Borghese, or the contrast in the spirited Pugilists and the numerous male portraits, or the still more expressive Magdalene, in which is so perfectly idealised that complete dejection which has inspired for centuries so many famous painters. And all these works are here, with an additional interest in their associations; in many cases the perishable model "pointed," for the sculptor to reproduce in imperishable marble.

When we saw a portion merely of Canova's collected works in the gallery at Bassano, we could not help drawing a comparison unfavourable to the arrangement of the Gibson collection at Burlington House; and even here, in the mountains, in a portion of Italy but little frequented by strangers, there are considerably more visitors to the Canova Gallery than the Burlington House authorities can record in their upper room, although amply, indeed, would the visitor be repaid for ascending those few steps, even if Gibson's works were not there, by the sight of an original work by Michelangelo and three or four superb portraits by Reynolds,—to say nothing of the collected diploma pictures of the Royal Academicians from the earliest days to one of the last gifts, that of the St. Jerome, by the present accomplished P. R. A., or, perhaps, even more interesting, Marco D'Oggione's copy of his master's perishing "Last Supper."

All the numerous works left by Canova, which show his powers as a sculptor, a painter, and an architect, evince the extraordinary effort he made to attain that ideal of which, from his youth, he had never allowed himself to lose sight; his fame as an artist may be said to be universal, but the modesty which veiled his nature is less known to the public, as also are his beneficence, and those virtues of a patriotic citizen which he on more than one occasion displayed so openly.

All the numerous honours which were heaped on him he received as a tribute to that art which he represented; all the riches which he gained by his numerous works he spent in acts of public and private benevolence, and long will the fortunate country of his birth be daily reminded of his loving sympathy.

While he lived, his house and studio were ever open to young aspirants, whose first works he often purchased; while secretly he aided more than one suffering artist's family, and cheered more than one unhappy home.

It would be unjust to the memory of so great a benefactor to leave his birthplace without visiting, at some short distance from it, the village of Crespano, almost, one might say (in common with more than one village on these Alpine slopes), created by Canova, and where the generous traditions left by the artist have been continued by the noble family Canal, whose charming residence, not far from Crespano, is especially interesting to the English visitor, if not to the admirer of Canova, for, among the many recollections of the famous sculptor may be found his portrait by Sir Thomas Lawrence, while the same features, even more gracefully treated by another familiar hand, that of Angelica Kauffmann, hang at no great distance off.

It is a curious fact recalled by this picture, and one probably known to few but those who remember the pleasant evenings at Porchester-terrace of thirty years ago, that Mrs. Loudon, the admirable authoress of "The Mummy," was the god-daughter of Canova.

But several other interesting memories of Canova's connexion with England still remain in the peaceful province which gave him birth. Among these are especially worthy of mention as bibliographical curiosities, in the collection of the Arrigoni family, at their beautifully-situated seat at Valdobbiadene, two small volumes presented to Canova by the beautiful Duchess of Devonshire.* These works were at a later period given by Canova to the Arrigoni family. Each volume bears, written in pencil on the first page, in the minutest handwriting, its dedication;—on the "Horace,"—"The Duchess of Devonshire, *née* Hervey, to Sig. Canova"; and on the "Virgil,"—"Sent to Antonio Canova by Elizabeth, Duchess of Devonshire, *née* Hervey, in testimony of her sincere friendship and great admiration." Equally interesting is a gold snuff-box, presented by George III.'s Queen to Sir Charles Long, by whom it was given, as we gather from the words engraved on the lid, "To his friend Antonio Canova." Meeting with these modern English names, so familiar to us all, high up in the Venetian mountains, from which one may look down over

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* See *Builder*, p. 1166, *ante*.

* The high road leading from Treviso to Mestre, and so to Venice, along which all travellers entering the capital from Germany, passed, before the days of the railway.

† In a letter which we take from Sig. Cacciniga's interesting "Ricordo della Provincia di Treviso."

* One volume is the fifth satire of Horace (the journey to Brindisi), superbly printed at the expense of the authoress of the "Passage of St. Gothard," accompanied by an Italian translation, and a portrait of Horace taken from a medal in the Poniatowsky cabinet. But more beautiful is the "Æneid" of Virgil, translated by Annibal Caro, published in two folio volumes, on wove paper, with views of the places mentioned. The edition executed in Rome at the Stamperia di Romani (MDCCCXIX), at the cost of the Duchess, consisted of only 164 copies, distributed, we learn, only to the principal libraries and sovereigns of Europe. It is a fact worthy of addition to this, that it was the Duchess of Devonshire, doubtless at Canova's suggestion, who subscribed the first funds to establish what is called the English Academy of Arts at Rome, where so many English artists for the last sixty years have studied, more or less.

the great plain of Northern Italy, produces a strange effect on the mind, filled as it is, in this picturesque corner of Europe, with the traditions of the long by-gone Venetian school; but still stranger, it can be imagined, is likely to be the effect produced on the mind of the English traveller, who, like ourselves, might visit the interesting cathedral at Bassano, to find himself, on entering a side door of that Mediæval pile, confronted with an old friend in a copy of the famous Holy Family by Sir Joshua Reynolds.

Treviso.

A NEW ART PROJECT.

A recent number of the *République Française* publishes the new regulations for the future management of the annual Exhibition of the *Salon*. The Minister of Public Instruction and Fine Arts, who has put these regulations forward, is deserving the gratitude of the whole artistic world for the broad and judicious liberality that these new rules offer to the workers in the fine arts, and for the means of instruction that his project holds forth for the future of French and foreign art generally.

The Minister of Fine Arts, with a rare originality that must be the result of careful study and a profound acknowledgment of precedents, with an acquaintance with the failures and difficulties that all those encounter who desire to secure general satisfaction, seems really to have almost accomplished the solution of an apparently difficult problem. Impossible as it may seem, it cannot be denied that the minister's new project will at least reduce to a minimum the amount of dissatisfaction expressed, and the complainers will be found to be simply those who, under the old system, enjoyed special advantages, which now will be equalised for all.

The Council of Fine Arts (reorganised by a recent Governmental decree), held on Wednesday, the 13th of November,—the same day that our Royal Academy met to appoint the new president, — first meeting under the presidency of the Minister of Public Instruction and Fine Arts, who communicated to the council some resolutions altering in an important degree the administration of the fine arts.

These decrees consist of a recommendation to encourage even still further instruction of "drawing," but especially of a project tending to greatly modify the existing regulations of admission to the yearly Exhibition of the *Salon*, a project on the terms of which the Minister invited the council to deliberate and give their opinion. These new regulations are now made known to the public.

In the first place, the much-vexed question of the jury of admission is to be solved by its election from a body formed of all artists whose works have already been exhibited at least three times on the walls of the *Salon*. There will also be in addition to the jury of admission, one to award the prizes and rewards. In these juries all the different branches of those arts which figure at the *Salon* will have a representant.

It has also been determined to hold, at the close of the *Salon*, an Art Union resembling that of the Paris Exhibition of this year, with the funds raised by which numerous works of art will be purchased.

An important innovation is that regarding the question of the free entries, distributed till now so unjustly, and to such unsuitable individuals: henceforward *all artisans, schoolboys, and soldiers will be admitted free of charge.*

Such are the most important innovations projected by the Minister of Fine Arts. Among the less important, are worthy of mention the following:—Every artist must write on a label, to be attached conspicuously to the frame, the subject of the picture, as also his name; the exact dimensions of each picture are to be inserted in the catalogue; and as a minor point, we notice the exclusion henceforward of all copies on enamel.

But the most novel portion, probably, of the new project consists in the formation of an exhibition of the refused pictures, an innovation which may lead to singular results. Furthermore, every five years, will be exhibited the most successful works that have figured in the five previous exhibitions. In addition to these innovations, mention should be made of the formation of two important committees, one to be entrusted with the Government commissions and purchases, the other with the conduct of artistic missions at home and abroad.

These new regulations gain additional interest from the certainty that the French Minister for Fine Arts has not only given the matter careful consideration, but he has been guided by practical men, whose lives are devoted, as so many lives are in France, to the study of the fine arts as an element of the greatest importance in establishing a nation's name in the history of the world: affording, in addition, another proof of the desire of the French Republic to advance the æsthetic institutions of the country.

ROCK-BORING MACHINERY IN CORNWALL.

The recent depression in the mining industry of this county, owing to a rapid and complete fall in the price of tin, has exemplified in a marked degree the well-known proverb, "'Tis an ill wind that blows nobody good."

Every sovereign's worth of tin costing some 25s. to raise, naturally reduced "the adventurers," as the shareholders are locally called, to utter despair, and, with many of the smaller mines, resulted in the stoppage of the engines and the letting in of the water; while the miners, thrown out of employment, were forced, together with their families, to emigrate, and seek their daily bread in other climes. The bigger mines, on which more outlay naturally had been expended, and which, therefore, seemed worth more to the adventurers, were only kept going by sheer pluck and determination, and at great expense, in the hope of a turn in the tide of low prices. Many despaired, but many, fortunately, turned their thoughts and serious attention to economy in production, with the resulting discovery that the means hitherto employed to raise the mineral had been extravagant and wasteful in the extreme, and that, under proper management and economy, now for the first time really called into play, tin could be raised at about half the cost!

Nor was this all. Mine adventurers and mine agents, the latter, as a rule, a class too closely wedded to old ways and customs, began to see that there was something in rock-boring machinery after all, and to turn a more attentive ear to those who advocated its merits.

The Diamond Rock Drill Company and the Barrow Company were, we believe, the first to avail themselves of the route thus thrown open to them, while, in their wake, the representatives of the "M'Kean" drill, the "Darlington," the "Eclipse," the "Champion," and "Jordan's Hand-power Drill," have crossed the Tamar; so that, what with the many drills before their eyes, and those further advertised in the local papers, the adventurers and agents are not a little puzzled, and are somewhat in the position we might imagine the inhabitants of Venice would be if their "silent highways" were suddenly to be converted into macadamised roads, and they had, in place of their gondolas, to make use of beasts of burden and of draught!

The vendors of horses, mules, asses, oxen, and perhaps camels and elephants, would soon be in the city, each vaunting the merits of his own peculiar class of beast; the Venetians would see the necessity of making a choice, but feel themselves, from entire ignorance of the subject, utterly incompetent to do so. In some such position are Cornish adventurers and mine agents at the present moment.

The necessity for boring-machinery is patent to all, but they are utterly at a loss how to make selection. The Venetians would, after a year or so of experience, be able to descant freely on the merits of the various natures of quadrupeds, and so will these agents by-and-by, on the merits of the different drills, but just now they feel themselves in the dark, and unable to walk except with cautious and timid steps.

We imagine there is as much difference between rock-drills as between the beasts of burden and draught we have supposed the Venetians called upon to choose from. They cannot all be equally good, and so, while some mines have boldly purchased some expensive drill or other and set it to work, others have pursued a more middle and safe course, and contracted with the proprietors of the drills for the "driving," as it is termed, of so many fathoms of levels at the ordinary hand-labour price, the mines supplying, as a rule, the steam necessary to work the air-compressors, in return for an agreement on the part of the contractors to drive at least at double the speed of hand labour.

Thus in one-half the time that used to be occupied, generally in less, ground is explored and communications made to the very great advantages of all interested in the mines, while the agents are afforded time to become acquainted with machinery utterly new to them, and to learn the respective merits of each kind.

The disastrous fall in the price of tin, by compelling proper economy in production and by paving the way to the extensive use of boring machinery, has decidedly lined with silver the dark cloud that it threw so thickly over the whole county of Cornwall, and if the present rise in prices continues, will possibly prove to have been of actual benefit.

It is certain, however, that while the shareholders or adventurers may be, on the whole, the gainers, the miners themselves are reaping, and will continue to reap, incalculable benefits; for not only are they relieved of the heavy, exhausting, nay killing work of boring by hand the holes necessary for blasting, but no matter how far the "end" where they are working may be from the nearest shaft, or how deep below the surface, the compressed air, which feeds and works the drill, issuing from the exhaust-pipe as fresh, cool, and pure as when it left the ground above, enables them to work almost as well, and perhaps with as little danger to health, as if they were at the surface.

Surely, with this flooding of the "dead" and unwholesome "ends" of Cornish mines with pure air, "miner's complaint" and other serious ills will well-nigh be stamped out, and the wonder and shame are that the priceless boon now afforded should have been brought about in struggling to economise in expenditure of money, rather than in the more laudable endeavour to economise in expenditure of human life, and that that which the highest prices for tin failed to accomplish in extorting from the hands of wealthy and gratified shareholders has been derived in so different a manner.

It is hardly in our province, even were it in our power, to review the comparative merits of the dozen or more rock-drills, and their attendant compressors, that are now before the public, and on which extravagant encomiums are lavished by the proprietors in almost every case.

The main points will be apparent to all. The air-compressor must work efficiently and with the least possible expenditure of steam, and the drill with the least possible expenditure of air. This latter desideratum is very necessary, for it is a no small matter of importance in the long run, whether 2-in. or 4-in. tubes have to be used, not only as regards the first cost of the tubes, but as regards economy of labour in fixing, and especially of economy in space.

The drill should be as light and portable as is possible, in combination with efficiency; should be simple in all its parts, and be calculated to work steadily on, month after month, underground, without the necessity for sending it on its upward and costly journey to the fitting-shop for repairs.

The mines of Cornwall have at present the monopoly of all the boring machinery in the county; but the time is not far distant, we think, when it will be seen at work in many large granite and elvan quarries, and the consequent reduction in the cost of building-stone thus brought about would not fail to be a subject of congratulation with all our professional readers.

Roman Remains, Lincoln.—Recent excavations in Lincoln have revealed the bases of four columns in fairly perfect condition, with a portion of their circular shafts still remaining. Two of these are evidently a portion of a row of columns forming the side of a portico. The two others not only indicate the end, but the commencement at right angles of another row. They have the remarkable peculiarity of being "attached,"—the two columns are built, as it were, into one another, and although in separate stones, the abutting column is worked out in a hollow to receive its neighbour. One is larger than another; while the three smaller columns are 2 ft. 6 in. in diameter, the return column is 2 ft. 9 in. The bases are imitations of the classical Attic bases tolerably well wrought, but with many very apparent departures. They stand on square plinths, and the whole composition, columns and bases together, is about 5 ft. in height from what was the original flooring. The space from column to column is four-and-a-half diameters, a very wide proportion.

THE ORGAN AND ITS TREATMENT.*

I DO not conceive that any excuse is needed, nor apology on my part, for bringing this subject forward. To those who are conversant with it, I have nothing new to say; nevertheless, an inspection of the drawings of new churches constantly published, and a visit to those that are built and building, makes me feel that at any rate if many persons know what they ought to do with regard to this noble instrument, they in many cases leave it undone.

I shall confine myself to the subject of organs in churches, as not only being one that presents greater difficulties in treatment, but as coming more frequently under our notice than organs in rooms. I speak, too, of *new* churches. I do not propose to treat the matter from an antiquarian point of view, although from that standpoint the subject is one full of interest, and is as yet but little investigated; nor, on the other hand, do I wish to be guilty of treating the matter as though the organ were the one thing for which churches and choirs existed. I fear that the lovers of, and the performers on, this instrument are far too apt to take this latter view of the case, and in conversation with organists I have often found it impossible to induce them to appreciate the fact that the organ, the choir, and all the musical arrangements, exist only for the purpose of duly rendering the service of the church, and, standing alone, mean nothing. It would be well if we were more in the habit of viewing our architecture from a similar point. In illustration of what I have just said, I may be permitted to refer to a conversation I had some time since with Dr. Wesley, late organist at Hereford,—one of the most accomplished musicians and performers of this century. I had been with him to a large church in a county town. The organ stood exceedingly well in a lofty and open aisle of the chancel, conveniently near the singers and vestry, and I remarked that this was good. The Doctor agreed that it was fair, but then a flight of the imagination took him to far more musical regions: "If that church were mine, I would take out the east window, throw open a great arch, and stand the organ over the altar. How it would sound down the church! You *would* hear it then!"

My best course will be, firstly, to describe the machine itself (not technically, but only enough to answer my purpose); and, secondly, to consider what is its best position, and the conditions of that position, including its external as well as general treatment.

Firstly, as to the machine itself. To have some acquaintance with the interior arrangement of the organ is really essential to treating it rightly when drawings are being prepared for a building which is to receive an instrument of the sort. If we have to design a hospital, we make ourselves acquainted with a host of particulars without which our design cannot be called a true piece of architecture. The same with a picture-gallery or an hotel; and now we have to take into consideration that a particular part of a given building is to receive a particular thing for a given purpose. It is, therefore, our business to have some acquaintance with this particular thing. Although the varieties are infinite, yet everybody knows what the outside of an organ is like. The old-fashioned case was often a splendid monumental, but frequently cumbersome and unmeaning, thing. The modern one is an ugly box, surmounted by a stack of pipes, reminding one of a zincworker's premises in the New-road. The architect finds, on further investigation, that this case takes up a great deal of room, but has not anything very substantial inside,—a great many little sticks, a vast amount of dust, and other things, not to be understood, but generally a large box somewhere near the roof, and this box often presents a most ugly and obtrusive appearance from the outside. I am so well aware that I am addressing an audience acquainted with technicalities, that I shall not presume to go into a great number of details that might otherwise be needed. The organ-builder is the best man to consult on the question of the internal plan of the machine, but unless we are ourselves somewhat acquainted with what he will have to tell us, we shall find that, perhaps by our plans and sections of building, we have put him and his organ at an unfair and unnecessary disadvantage, and are not at all able to understand what he would tell us. I will say, then, that generally an organ consists of four main divisions, called the great organ, the swell organ, the choir organ, and the pedal, the first three divisions being controlled by three manual key-boards, the fourth division by a pedal-board. Each of these divisions of the instrument is, in a manner, complete in itself, and consists roughly of (1) the pipes; (2) the wind-chest,—like a double table-top, on which the pipes stand and from which they receive the wind which makes them speak; and (3) the mechanism that connects these divisions with the key-boards. Common to all, unless the instrument be of large dimensions, is the apparatus for "raising the wind," viz., a reservoir to hold it, and feeders or bellows to pump it into the reservoir. Wood trunks or conduits convey the wind from this reservoir to the various departments of the instruments. Lastly, the department put second, the swell-organ, is enclosed in the great box already referred to, and which, as we all know, makes the sound *piano* or *forte* as it is shut or opened by the performer. The question now presents itself, "What space ought we to allow for an average instrument of the above description?" We have to accommodate the organ, the blower, and the player,—to accommodate them, not merely to say that they can all be packed away in this or that little hole. It is often the case that an organ of needless size is put into a church. There is a passion nowadays for monsters. A huge machine of fifty stops in a church where one of thirty would amply suffice, and sound more effectively, is not now an uncommon thing. If the architect knows from the first that he is to stable such a monster he is to blame if he does not do it to advantage; but where, as is usually the case, he does not know what is coming, but has only to make adequate provision for a sufficient organ, he is not to be blamed more if the monster be pent up than if his pulpit would not hold a Daniel Lambert. We do not want Daniel Lamberts in the pulpit more than we want these roaring monsters in the aisle. Taking, then, the size of an average organ in an average church, we shall find that the pipes are in many instances things of considerable size. The pedal department has pipes of 16 ft. speaking length. With the block on which a pipe of this length stands, we ought not to allow less in height than 18 ft. to take it, and where the church is one of low pitch we may take this as an average minimum height for the organ-space. A large organ will have pipes of 32 ft. speaking length in the pedal department. If these pipes are of metal, such as those in front of the organ at the Crystal Palace or the Albert Hall, they will be 40 ft. long over all, or thereabouts; if of wood, they will require about 34 ft. of length. It is obvious that if there be height enough to accommodate pipes of this length, there will be abundance of height for the rest of the instrument; but this does not always follow in the first case put,—that of pipes 16 ft. long. The "great organ" is the department of the instrument that next claims our attention. Whilst the "pedal organ," or at least, its longest pipes, frequently stands on the floor, or just above it, the great organ, and indeed all the other departments, are lifted up, and, within reason, the higher the better, as the sound gets away above the heads of the people and the inclosure of the lower part of the case. Our average organ will give us, as the longest pipe with which we have to deal, one of 8 ft. speaking-length. This pipe will be 10 ft. long or thereabouts, but as the wind-chest on which it stands will need to be some 6 ft. from the floor, we find the top of the pipe about as high up as the top of the pedal-pipe first referred to, viz., 16 ft. or 18 ft. In the "swell organ" the length of pipes is the same as in the great, and as the whole of this department is usually enclosed in a great box or wooden room, a less height than that already given will not do. The organ-builder usually endeavours to raise the swell-box as high as possible. It would appear that the best musical effect is so obtained, and the choir organ is not unfrequently put below it. In this case a greater height is needed than that already given. In the space below the wind-chests of the great, swell, and choir departments, usually lies the reservoir, &c., on the floor. Those who wish to see this plan more fully explained will find a section of it in the folding plate at the front of the great work on organs and organ-building by Messrs. Hopkins & Rimbault,—the standard work on the subject in this country. We now come to the question of floor-space required for an average organ, again supposing, as I have hitherto done, that there are no peculiarities in the site which necessitate an arrangement out of the common. A square of from 14 ft. to 16 ft. on a side will answer the purpose well. If in the scheme of the instrument there be many pedal stops, then more space is needed; if there be few, smaller space will suffice; but I may say that in an average-sized church, to accommodate 600 people, an average organ will probably occupy a space of 16 ft. by 16 ft. by 20 ft., and it will consist of four departments,—great, swell, choir, and pedal.

I now come to the second division of my subject:—What is the best position for the organ, and what are the conditions of that position, including the external as well as internal treatment? In the matter of position, I do not think that we ought to take precedent as our guide. By "precedent" I mean those old examples in plan, detail, &c., on which we base our architectural work of to-day. The organ in its present form did not exist in our Mediæval churches. It was vastly smaller and exceedingly clumsy. It did not need that a special place should be provided for it and due regard paid to its requirements in height, "speaking"-room, protection from changes of temperature, blowing, &c.; nor was the music so far developed as now, when the relative position of the organist and his choir is of no little moment, also that he should himself be well able to hear what he is about, and calculate with ease the weight of his accompaniment, that he should be able to see on what the clergy are engaged, and also have a reasonable view of the congregation. The modern organ is, in fact, as great an innovation on the Mediæval church plan as a heating-apparatus or gas-lighting. On the Continent, organs assumed large proportions long before we had one of medium size in this country, but the ordinary parish church did not often possess one of these instruments, and the scale of nearly all the more important ecclesiastical buildings abroad is so much larger than it is with us that a bulky organ could be accommodated in most instances without special structural preparation for it. My paper is to deal with ordinary new churches. In dealing with old ones the conditions vary in almost every case. By general consent the choir is now placed in the chancel, in the old place. It seems contrary to common sense to place the organ far away from the voices it is to support and accompany. Indeed, those few who advocate the removal once more to the west end are most fairly to be placed in my class of persons who would hold that the church and choir exist solely for the glorification of the organ. Presuming, therefore, that the chancel is accepted, and that the organ is to be immediately at hand, we have to consider how the organ shall best be treated,—whether we shall build an organ-chamber, a transept, or an aisle; whether we shall divide the organ, or bracket it out from the wall; whether it shall be on the floor or raised, and if raised what benefits or inconveniences may result; whether we are likely to have a blowing-engine, or blow by hand, and if an engine where shall it go? And, over and above all these, our plans and sections must show that the organ will not interfere with the convenient use of the church by the clergy and congregation, and will not darken or obstruct the church. Then the organist should, as I have before said, be well placed for seeing and hearing, both for himself and for others, and should not be in the dark where artificial light is needed, and where, consequently, additional danger from fire exists. The first great *desideratum* is, that there should be abundant space about the organ, and, above all, height. As a matter of fact, the musical man so often hankers after a west-end organ, not because there is any special virtue in that locality, but because his sensitive ear discovers the charming quality and elasticity of tone given by that open situation,—unbroken space in front, abundant height, and sufficient room for the pipes not to be crowded up inside the case. He compares an instrument so placed with one put into what the obliging architect calls an "organ-chamber,"—a species of enlarged dog-kennel, with two little doors, one to the chancel and one to the aisle, the whole thing, arches and all, crammed with pipes whistling and screaming at one another, the bulk of them half above the crowns of the little doors aforesaid. The larger and more complete the organ is that is placed in this conventional organ-chamber, the worse will be the result, as each individual portion of the in-

* By Mr. Somers Clark, jun. Read before the Architectural Association on the 6th inst.

strument has less space about it. I am quite within the mark when I say that in many instances an organ that has cost, we will say, 1,000*l.*, when placed as before said is far less powerful in effect and less pleasing in tone than would be one with half the number of stops and similarly placed. Having already given the dimensions of an average three-manual organ, 16 ft. by 16 ft. on the floor, and about 20 ft. high, we have something to start from for ascertaining the dimensions of the proposed receptacle for the instrument. If the plan and sections of the new church are such as to make it most desirable that there should be a building more or less of the nature of an organ-chamber, it is of the first importance that this should be as thoroughly one with the church as possible. I could point to several instances in which the receptacle is, in itself, of ample proportions, but the arches into the church are low; there is consequently a vast quantity of the organ-sound buzzing above the tops of the arches, and which has positively to descend, after reflection from the roof, before we can hear it. Quality of tone is very much impaired by this. The roof of the organ-chamber should be as lofty as can possibly be got. The openings into the chancel and into the aisle should be as lofty as possible. Avoid an arch into the aisle, and continue the aisle-roof (if the aisle be lofty) right over the organ. Or, treat the chamber as a comparatively shallow and broad recess, cutting into the main roof of the chancel like a transept. The organ-front can, with this latter treatment, be made continuous with, or even project beyond, the line of chancel wall, and thus the effect of a large break in the length of the wall (architecturally most unsatisfactory) will be avoided. I should here explain that the arrangement of the various internal departments of the organ can be considerably modified to suit various positions. In the organ-chamber the instrument is generally arranged much after the manner I have already indicated. If, however, this chamber be shallower, or become, as it often may with advantage, a shallow transept projecting from the chancel, then the various departments can be placed over one another, and carried to a very considerable height. I may instance, as a very large and important example of this distribution, the great organ at the west end of the Marien-Kirche at Lübeck. This instrument is upwards of 80 ft. high and 40 ft. wide, but not more than 7 ft. or 8 ft. deep, standing in a gallery. I should here add that unless there be abundant height,—far more than we generally get in our modern churches,—it is not good to build a projection for the organ with the vestry below; at any rate, this should be done, if we are forced to it, in such a way that only the back part of the instrument will be over the vestry, the front part coming down to the floor, otherwise the organ is virtually behind arches and up in a gallery. In consequence of the smallness of our modern towers, and the necessary thickness of the walls in proportion to the size of the openings through them, the conversion of the lower part of the tower to the use of an organ-chamber is about one of the worst, and unfortunately one of the most usual, places. I may be permitted to give a few examples from time to time from existing works, and as I shall have to speak well of some and ill of others, I trust no one may think I am doing wrong. The examples of instruments stuck away in little holes and corners called by courtesy organ-chambers, and badly stowed away in the lower parts of towers, are countless. I could not particularise one especially, but I may refer, as an instance of successful treatment of the organ in a tower, where, on the face of it, one would not have expected success, the fine instrument at the Church of St. Mary Magdalene, Paddington; but here there is a good deal of height and clear space above. Of an instrument well placed in a shallow recess, a good example is to be found at the Church of St. Peter, Vauxhall. We will now consider the advantage or disadvantage of a transept. A transept may, as we all know, cut the longitudinal axis of the church in one of two places,—east or west of the entrance to the chancel. For my own part, I think a transept in either position to be a mistake in an ordinary church, not because it may not have a fine effect, if well treated, but because it is sacrificing the convenience and use of the building to effect, a thing which brings our profession,—and justly,—more into disgrace with common-sense folk than most other charges that can be brought against us. It is well known that the voice stands specially in need of support at the place from which it emanates. With a transept east of the chancel-gates, far from finding support, one finds the worst of all arrangements,—a large space *behind* the speaker, reader, or singers, as the case may be. With a transept west of the entrance to the chancel (and here the transepts are usually much larger than if placed as last stated), immediately at each side of the speaker or singers, but with less ill-effect to these latter, we find a lateral space, and if the roofs of nave and transept intersect, the voices, quite early in their career down the church, are positively led to either side, to the complete sacrifice of the western part of the nave. The organ, on the other hand, is nearly certain to sound well when standing in a transept, for the same reasons that it sounds well if stood at the west end; but, on the other hand, the connexion between the player and the choir is difficult to maintain. If the transept be at all deep, things cannot work well together. As an instance of a good treatment of transepts east of the entrance to the chancel I may quote the Church of St. Columba, Haggerston, but in this instance the transepts are so shallow that they are hardly more than a pair of great shallow organ-recesses, and on plan the church does not show transepts external to the narrow aisles. On the other hand, I see that at the new cathedral at Edinburgh, where no adequate structural provision seems to have been made for the organ so as to use it with the choir sitting in the eastern arm of the cross, it has been decided to place the stalls under the centre-tower, and so bring the singers and the organ as much together as could be managed. I should next mention an aisle (to the chancel, of course) as a place for the organ. As a matter of fact, I have already implied that a good "organ-chamber" will be at least equal to the construction of a nave aisle, and with that I must dismiss any further consideration of this arrangement, beyond saying that a flat or nearly flat-roofed aisle should not be less than 23 ft. or 24 ft. high if it can be avoided. Then comes the question, "Shall we divide the organ?" Every one who knows St. Paul's Cathedral, All Saints', Margaret-street, or St. Mary Redcliff at Bristol, has seen what a divided organ is. With modern mechanical appliances, doing this is a question of money only, not at all of feasibility. Although the instrument does not seem to have been much used in that way, it is evident that for antiphonal singing this arrangement is excellent. It also places the whole choir near that which is to accompany and support the voices. If well considered in plan and section of the building, I doubt whether any arrangement can be found superior to this. In churches the section of which is of considerable magnitude, carrying the organ on brackets from the wall, and at some little elevation from the ground, can be taken into consideration. The modern organ,—such a one as I have chosen to take as my "average organ," is, however, of such a bulk that it is not possible, without inconvenience, to lodge it upon brackets, unless also some recess in the church wall is made which shall take the more cumbrous parts of the machine. To quote a large example well known, the organ at the cathedral at Strasburg hangs from the wall, and has, I believe, all the pipe-work in the case, but the bellows are in a little projection from the triforium. The organ at Ely is not more than half of it in the visible case. A lot is stowed away in the triforium. At St. Paul's Cathedral all the pedal organ is behind the stalls, and not in the two cases, whilst the blowing apparatus and bellows are in the crypt. The little hanging-organ at St. Mary Magdalene's, Munster-square, is not of sufficient size to enter into our consideration here. I give the above instances of hanging organs to show that a great deal of consideration must be given to the convenient arrangement of the instruments in such a position. For musical effect, bracketing-out is often very successful, as it brings the bulk of the pipe-work fully into the open, and gives the sound abundant room to spread. The next question is, Shall we place the organ on the floor, or raise it up? I am somewhat doubtful of the benefits to be obtained by raising the organ. It should not, of course, stand low. The mouths of the pipes must stand clear and well above the heads of both choir and congregation, but I think that often there is not that complete unity between the two,—the singers and the organ,—that might be wished when the instrument is raised over-head on the top of stalls or in a gallery, although, for organ-effect alone, it is better than when on the floor-level. There are often, too, difficulties in communicating between the player and the singers when one is up above and the others are below. Of course, a long movement, enabling the organ to be played from the choir-stalls or close to them, can be had, but here, again, lack of money is usually a conclusive termination to dreams of this sort. As a gallery arrangement, nothing can be more picturesque, or for organ-sound be better, than that adopted at St. Agnes, Kennington. An instrument of considerable size could be accommodated in this church without inconvenience or obstruction, but, on the other hand, it is most inconvenient for the player. He cannot hear the singing well. He cannot see his singers at all, and I doubt whether any arrangement in a church of this size could, on the existing lines, be made very convenient. If the chancel were so much longer that the choir sat one bay further east than they do, some arrangement might be made, but charming as the scheme is in many ways, some grave difficulties have to be surmounted before success is achieved. The organs as placed in our cathedrals are the commonest instances I can give of gallery organs. In almost all instances they are placed on a floor at 18 ft. or more from the ground, but the buildings being so much larger than the churches which we are likely to be called upon to build, difficulties are more easily surmounted. Things are not all crammed together in a small space. Of course, there should be, in theory, a director of the choir, standing forward in the midst, and to his direction player and singers would look, but we seldom get this. I think that in many cases a couple of speaking tubes, starting from the organ, and carried north and south, one to each set of choir-stalls, might be of use to give directions, and avoid the passing about of messages on mysterious bits of paper, which from time to time seem unavoidable, even in the best regulated choir. I have tired you out with possible places for the organ, although there are yet others that may be thought of. I will only add on this head that the organ is best to stand on a wood floor; that windows near or behind the organ are a source of damp, chill, and danger to it; that a coil of hot-pipes near it, or even inside, is frequently of use to keep it in tune; that the space in which it stands cannot too carefully be kept dry, and is best if lined with wood, and ceiled below the rafters with plaster or wood. An open roof, unless at a great height above an organ, is a great mistake.

The next question was,—Are we likely to have a blowing-engine, or to have the organ blown by hand? The water-engine, now much used for blowing, is a most convenient and noiseless little servant, and will work away in a cellar, vault, or any odd corner, but the consumption of water is often an expensive item in accounts. Gas-engines are also used for the same purpose. I do not know of a church-organ blown by steam, but in the major number of cases with which we may have to deal, hand-blowing will most probably be used. Where it can be done, it is very desirable to get the blower and the handle at which he pumps out of hearing. To have one's thought suddenly distracted by the desperate pumping that is often resorted to by the wretched youth who has been nodding in some dismal corner of the church, is very unsatisfactory. On the other hand, unless there is some near prospect of blowing by machinery, it is not fair to place the handles in the vaults or in regions unknown, especially as, instead of waking at the right time, the blower is very likely to sleep on placidly when his exertions are much needed; but it must be remembered that it is quite possible, and, indeed, usual, to have hand-blowing as well as machine-blowing to the same organ, so that the former can be used when the latter is out of order. Provision can, therefore, be made for an engine in any case.

The statement I have already made that the organ must be so arranged as not to block up the church, encroach on passages, or darken the building, speaks for itself. I may, however, suggest that the position of an outer door may seriously affect the comfort of the organist and the health of the organ, and I may say the same of a window. I think, however, that I should not leave unconsidered the provision for convenience of the player. A vast deal of the

good effect of the organ will result from the player being able to ascertain what effect he is producing, and how much power of organ-tone he is employing. In many cases he is really placed inside the organ-case. A notable instance of this may be seen at St. Peter's, Eaton-square, where a doleful little den, a sort of forgotten hole, is the place from which the superb organ has to be played, and the choir and people accompanied. A case overhanging the player's head to a considerable extent is, as a rule, unsatisfactory. He cannot hear his organ enough, and it sounds dead.

I must now hurry on to a consideration of the organ-case,—to us of considerable importance, and, indeed, of no little moment to the organ itself, as in a smallish church, or where the openings from the space in which the organ may stand to the church are restricted, a case may very much diminish these openings. We all know those dignified old cases in which most of our earliest English organs of the seventeenth and early eighteenth century have been enshrined. Numbers of them have gone, destroyed by Vandallic "restorers." They were not, doubtless, built on very "true principles." Some,—such, for instance, as the case at St. Paul's Cathedral,—are excessively solid, and without apertures, but it is superlatively painful to see a stately old fabric, such as that which formerly graced the west end of St. Mary Redcliff give place to a mere row of "tall-boys,"—a regiment of zinc chimney-cans,—and which are not, as a rule, on truer principles than were the old cases. According to theory, each pipe in an organ should stand on the sound-board, and not be placed at some little distance from its brethren, merely for show; but in most cases it is really an advantage to remove some of the largest pipes from within the instrument, and place them where they have unlimited speaking-room. A consultation with the organ-builder, and a thorough understanding of how he sees it best to lay out the plan of the various departments of the organ, will enable the architect to arrange the case so that it may be at the same time truthful and ornamental. If we take a row of pipes,—metal open diapason, we will say,—we shall find that as each one rises in the musical scale, it diminishes in size and length. When, therefore, we see in the pipe-stack case beloved by the modern Gothic mind, that there is a tall pipe in the middle, and pipes diminishing in exactly corresponding length on either side, we see almost to a certainty what is not true. These pipes are longer than they really ought to be. If we go behind, we shall see holes cut in the backs of these pipes to prevent the length of the vibrating column of air within being over the due proportion. All of the pipes, therefore, beyond this proper length, is sham. There is not the faintest reason why woodwork, tracery, &c., should not enter largely into the making of the case, and in many instances pipes may be arranged in two or three stories above one another, and represent the internal construction of the organ. Those tremendous edifices we see at the west ends of many large Continental churches are seldom good examples to quote. They are sumptuous, but very false in every way. I need not enter into a description of an average English organ-case. I here refer to seventeenth or eighteenth century examples, but may say that the scroll-work which appears immediately above the pipes has its use. It not only gives richness to the skeleton of the case, but it masks the unequal lengths of the pipes, and brings the whole design into symmetry. You will find exactly the same thing in idea, but with Gothic detail, in the organ-case at Strasburg, and I could mention several other Mediæval examples. This method of designing the front is common to the greater part of Europe. In Italy, however, and some southern parts of Europe adjacent, a somewhat different system prevails. Here the case is considerably taller than the longest pipe that is to be shown, and is more like a sort of temple front or piece of very open Renaissance screen-work, with the pipes standing inside and showing the inequality of their real lengths quite honestly. The lines of the case are usually very defined, and consequently the unequal length of pipes is not at all disturbing or inharmonious. I think that the organ over the west door at the Madeleine in Paris is so treated. In Spain we find another peculiarity, also very effective. Here all churches of any importance have two organs, and very sumptuous the cases are, covered with carving and gilding. The general type of case is much the same as that first described, but at the top of the solid panelling of the lower part of the case, and immediately below the vertical pipes, an armoury of trumpet and other reed stops bristles forth, supported horizontally by iron rods or brackets. The effect is curious and not unpleasing, but it is essential that the organ should, as it usually does, stand up in a gallery. The horizontal pipes would look most horrible just overhead. In small churches I have seen these reed-stops project certainly as much as one-third across the church, and yet with no ill effect, but they are not crowded close together, although one may see four, five, or six rows one above another.

I dare say that the length to which this paper has already gone will lead you to see that there is yet a vast deal more to be said, but I am not anxious to say it, nor can you be to hear it; but a moment's consideration will show that the historical and archæological side of the question, also the architectural study of old examples and the adaptation of the organ to old buildings, have not even been touched upon. The subject is immense. Indeed, there are very few machines of man's invention more complex or wonderfully interesting than the organ, the king of musical instruments.

ROMAN MILITARY ROAD THROUGH DURHAM TO NORTH WALES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

AN important paper on the above subject was read on the 4th of December, before the British Archæological Association, by the Rev. Dr. Hooppell, rector of Byers Green. We print some extracts from it:—

No two antiquaries appear yet to have agreed upon the course laid down in the Tenth Iter of Antonine, although very many have endeavoured to solve the enigma presented by that route. My attention has been for some time strongly directed to the subject. The main cause of the difficulty that has hitherto been experienced in endeavouring to assign a reasonable course for this iter appears to me to have arisen from the fact that in every case a wrong starting-point has been taken. Horsley selected Lanchester; Camden and Burton, Wentsbeck; Bishop Gibson, Caervoran; and later writers have chosen other places; but, in my opinion,—and I think I can give good grounds for the opinion I hold,—Tynemouth or South Shields should have been the station. The recent excavations at South Shields have proved what a very important military post the promontory of the Lawe, at the mouth of the Tyne, was, and the history of the centuries immediately succeeding the departure of the Romans shows that Tynemouth, on the opposite bank of the Tyne, was a place of remarkable note in Saxon times. I have, on a former occasion, given reasons for believing South Shields to be the Tunnocelum, and Tynemouth the Glannibanta, of the Notitia. Glanoventa, or Glanovanta, from which the Tenth Iter takes its departure, is identically the same, in point of language, with Glannibanta. Each in Keltic means "The brink of the height," and if the final "a" be dropped, each is good Welsh, at the present day, for the site of Tynemouth Castle.

It is a circumstance supplying a very strong argument in favour of Tynemouth or South Shields being the starting-point of this Iter, that the accounts which have come down to us of the great roads *left* by the Romans in this country, make the mouth of the Tyne the terminus of the one which ran across the island in a south-westerly direction. In Leland, vol. iii., p. 370, we read:—"Rekenild Streate, going from the south to the north Vulturnal Country, both begins from the aforesaid Menevia, and goes through Wigornia, by Wicombe, by Birmingham, Lichefeld, Darbe, Chesterfeld, York, to the mouth of the river Tyne." This is on the authority of Giraldus Cambrensis. The following, in vol. iii., p. 395, is from "The Book of the Histories of Eulogius":—"The Fourth way is called Lelm Streate, going from the south to the north. For it begins at Menevia, and proceeds by Herford, Wigorn, Wicum, Bermingham, Lichefeld, Derby, Chestrefeld, by York, to the mouth of the River Tyne."

The county of Durham abounds in traces of ancient roads, and I will not now discuss what may have been the precise course of the Wreckendyke, Rykenild-street, or Lelm-street, for it bore all these names, after it reached the heights of Wreckenton and Eighton, but I have very little doubt it crossed the Tees into Yorkshire at Pounteys Bridge. This bridge has long ceased to exist, but there can scarcely be a question that it was Roman, and that the road across it was the great avenue into the Eastern half of the county of Durham, as the road across Pierce Bridge was into the Western half. Pounteys Bridge, and the ford which succeeded to it after its destruction or decay, continued on the high road for many centuries. It was not till a comparatively recent age that the ancient road gave place to the modern one through Croft and Darlington.

Galava is the first station mentioned after Glanoventa, and the distance given is eighteen miles. I cannot myself make out the Roman miles to have been much different from our own. They would be shorter, if anything, but they appear to have varied somewhat in different parts of the kingdom, according, possibly, as they had been measured by different persons or at different times, but to have been on the whole not much less in length than ours of the present day. Durham or Old Durham would suit well as regards distance, from Tynemouth or South Shields; and the signification of the name, Galava, would suit equally well. Gal afan, pronounced Gal avan, is in Keltic, "a high plain," and is applicable to a comparatively level piece of ground at a considerable elevation. No description could be truer of the existing cathedral-crowned eminence, or of the neighbouring entrenched mount, where the site of a Roman fortified post is, by general consent, placed.

Among other reasons which lead me to conclude that the Wreckendyke went, in a direction not far from Ripon, to Mancunium and Mediolanum, is the fact that there must have been a great road to that city from Jarrow, Chester-le-Street, and Durham, in very early times. The monks of Lindisfarne, in the year 882, driven from their island by the Danes, after many wanderings, settled in Chester-le-Street; in 995, still fleeing southward, they went to Ripon. They carried with them their treasures, and St. Cuthbert in his ponderous stone coffin. They must have gone by a good paved road, and we have no reason to think there were any such in the kingdom but those that had been left by the Romans. A few months afterwards, in 995, they returned again from Ripon, and instead of going back to Chester-le-Street or Lindisfarne, selected a new spot, Durham, some distance, but, as I think, no great distance off the road. In 1069, they went from Durham to Lindisfarne, stopping the first night at Jarrow, which must, therefore, have been on the direct road, the second night at Bedlington, the third at Tughil, and the fourth at their journey's end.

In strong confirmation of the opinion here expressed is the discovery in 1874 of an important and wealthy Roman station, on the site known for ages past as Castle Dykes, about three miles north of Ripon.

From the neighbourhood of Ripon I have not traversed the country towards Manchester, but I have a strong conviction that the road passed thence to Ripley or Harrogate, and so to Bradford and Halifax. The names of many localities on the route indicate it. We have Staineley, Brackenthwaite (Horsley says the Wrekendyke, in North Durham, was also called Brackendyke, and the connexion between the two words Wreken and Bracken appears to be very close). Stainburn, Castley, and Stanningley. The most probable explanation of Harrogate itself is "Here Gate," "Army Way," "Military Road," and Stainburn or Castley is at the right distance from Romanby for Bremetonacæ.

Burlington Colonnade in Battersea Park.—All who know Battersea Park must have noticed the prostrate pillars by the river-side, near the Albert Bridge, mixed with friezes, carved with crests and coats of arms, other stones more or less broken, and amongst these ruins some huge wooden doors, with their great knocker still attached. These stones formed the well-known colonnade of old Burlington House, in Piccadilly. The *St. Mary Battersea Parish Magazine* says:—"It is a sad pity that these stones are not set up, if only as a picturesque ruin, or, as we would suggest, as an entrance to the Park from the broad boulevard that runs along the Thames, and which greatly needs some feature to relieve its long monotony. The palatial residences on the Chelsea Embankment would benefit more than Battersea by such a river gate to the Park."

MR. CRACE'S VIEWS AND MAPS OF OLD LONDON.

The collection of maps and views of Old London, which has been lent by Mr. Crace for exhibition in the rooms at South Kensington where the Caxton exhibition was held, was open for a preliminary private view on Tuesday afternoon last. The extent of the collection must have surprised many of the visitors, and confounded those who wished, like ourselves, to enter on an analysis of its contents. This is really impossible until we are in the possession of the catalogue, which is not yet ready. While mentioning the fact, we may at the same time express the hope that it will not be delayed, as is so constantly the case with exhibitions in the region of Kensington, until the period of exhibition of the drawings is nearly over. Grievous were the complaints in regard to this delay in the case of the Caxton Exhibition. But as the works exhibited are in this case the private collection of one owner, and as Mr. Crace is a man of business, we have reason to hope that the properly tabulated information will be forthcoming at the proper time.

We must content ourselves for the present with a few general observations only, which may serve to call attention to the remarkable interest of the exhibition to all who care about the history of the growth and development of the tract of country covered with buildings, into which "the cities of London and Westminster" have now expanded. The views exhibited include a multitude of careful engravings of buildings which have long since disappeared, but which have played great parts in the history of London life, social and municipal, and whose names and objects in many cases still exist in new and equally-renowned structures. The engravings include also many which are of value as records of social habits and character; scenes in the old Mall, &c., with the costumes and habitudes of the period stereotyped for us, so that we can not only see in imagination the old lines of the parks and streets, but people them with the men and women who carried on business or flirtation in these now changed or forgotten enclosures and thoroughfares. Old London seems spread out in perspective before us, and the more we examine the drawings and compare one with another, and with onr own present knowledge of the places represented, the more widely interesting the subject becomes. Into many of the suggestions and reminiscences, architectural and historical, which this remarkable exhibition gives rise to, we hope to go in some detail when the exhibition is open to the public, and when, as we have said, the catalogue (it is to be hoped) will be at hand to assist us in making notes and references in a systematic manner.

Meantime, just a few words, the result of necessarily hasty jottings, in regard to the maps, which are hung in a separate room at the end of the long gallery containing the bulk of the collection, and which, though less attractive to the general eye, perhaps, have really as much interest as any part of the exhibition. The collection of maps is, we believe, nearly complete in regard to all known to exist previously to the present century: subsequently to 1800 of course they become more numerous and of less archæological value, and a selection of the best only has been made. The maps have been hung in chronological order, the first one of all being a sketch, made by Stukeley (or from his collection), of London in the time of the Romans, but the authority or basis for the conclusions embodied in the map is not given. It shows a long, narrow strip of town running in a north-easterly direction from the point where London Bridge has for so many centuries, in one form or another, given a passage across the Thames. We jump from this to the map by Ralph Aggas, made in 1560, but not published till 1603, and showing us London in the time of Elizabeth. This is the most complete example in the collection of the old notion of mapping a town in a manner which is a cross between a plan and a bird's-eye view, and in which the necessity of finding room for the gables of the houses and at the same time showing the streets, leads to obvious and inevitable inaccuracy of plan, though no doubt the general result is more interesting to the eye and the fancy than that of a plan with contour lines. The map shows London as a considerable town in appearance, though we realise effectually the enormous difference between that and the modern London when we trace on the map of the latter the boundaries of the Elizabethan town eastward extending to Aldgate, northward to Hounds-ditch and "London-wall," westward to Temple-bar and Chancery-lane, while a long strip runs down the north bank of the river to Charing and Westminster. We were looking for some map which would show us "the Strand," as we cannot but think it must at first have been built in order to gain its name, *i.e.*, as a single row of houses fronting the beach or "Strand," which would have formed the roadway in front of them. But this, the oldest map in the collection, shows the Strand as a street built on both sides, and quite separated, by houses, from the river bank. The various gates of the City, Ald Gate, Moor Gate, New Gate, &c., are shown on the view or map, which ever we like to call it, in perspective, and help us to realise the actual growth of nomenclature of streets, whose names we use every day with little remembrance of the circumstances under which they arose. The next map, by Rischer (1604), shows the names of the streets much more fully and clearly, and has, in fact, in every respect, more of the clearness and precision properly belonging to a map. There is not much difference in the extent of the town, the additions being chiefly in the north-east, adjoining Bishopsgate and its neighbourhood. It is curious to see here Wentworth-street as a new and principal street in the outskirts of London. The street now exists under the same name, and probably on the same lines, as a narrow back-street in Whitechapel. The eastern part of Cannon-street shows on its present lines, but is called either Canning or Conning street, the type is too indistinct to be certain which. The connexion with St. Paul's-churchyard is only by the still existing route of Watling-street and Budge-row, now also in their turn degraded into back streets. The changes in the way of spelling the names of streets are curious, and apparently very arbitrary, as shown in the case of Cannon-street among others, which, in the maps a little later than the one we have been just noticing, assumes its present spelling, but, later on, is altered to Canon-street, in 1688; in a map of 1690, it is "Cannon"-street, and in one of 1700 is again "Canon," and the same kind of change backward and forward in etymology is observable still more curiously in other cases. Faithorne's map (1658) is the next of importance: we here see the Whitechapel district slightly extending, and we find Piccadilly as a road leading out of town, all fields to the north, so that "Green Pastures and Piccadilly" is only an expression of the early topography after all. "Piccadilly Hall," at the east end of the road, is the only building on the north side of it: and not far from this, on the precise spot now occupied by the Criterion, is a large isolated house, marked "Gaming House." The site of the Westminster Palace Hotel and the Aquarium appears as "Tutle Feilds," a name which soon alters in succeeding maps into "Tuthill." Some of the best plans after the fire are executed by poor Hollar, who had to sell himself to the map-engravers for a living, and illustrated his mechanical work of plan-drawing by beautiful little marginal drawings of "principal edifices." A Dutch plan showing the portion of the City cleared by the Fire ("a huge half-moon, a monstrous cantle out") is accompanied by another showing a scheme for rebuilding the burnt-out portion, in a truly Dutch fashion, in squares formed by the intersection of straight streets, giving the whole the effect of a gridiron on the drawing: the Dutch planner has the consideration to leave (of course, at equal intervals) open squares, and he might claim the merit of having provided a number of wide streets at right angles to the river and giving a view of it into the town, only that it is quite certain he only did so because otherwise his squares would not have been symmetrical every way. However, burnt London was not rebuilt on the Dutch plan, and we may be glad that it was not, for we have at least some of the old lines preserved, instead of having the whole totally obliterated. The date of this map is 1666. In 1675 is Green's map (drawn by Hollar), and in 1690 one from the Stowe collection, in which we first notice the present St. James's-square as a specially-defined space called St. James's-fields, and partly surrounded by houses; and St. James's Park water appears as a long straight canal running up to the front of the then Buckingham Palace, just in the same style as the Hampton Court canals, with a regular avenue of trees on each side. The development of the eastern extension of London is of interest, as shown in these maps. For some time it is entirely confined to the gradual extension of houses in a scattered manner along what is now Whitechapel High-street and Mile-end-road, but which in almost all the old maps is designated as "the road to Harwich," which place was thus obviously, from the importance thus attached to it, at that time a principal port of communication with Holland, and its revival by modern companies as "the fastest route to the Continent" is only restoring it to its former position. The two great arteries out of East London, Mile-end-road and Commercial-road, are now so similar in apparent age and importance that it is difficult to realise that the latter is only a new thoroughfare in comparison; but so it is. For centuries, Mile-end-road, as "the road to Harwich," was the great route out of London eastward; "The White Chapple" formed an incident on the road, and "Mile-end," probably named as being a mile from the old gate (Aldgate), was another. South of this road was open country and fields traversed by a straggling lane called "White Horse-lane," and even after Mile-end-road had been completely built along, the land south of it remained *in statu quo*. But the coming change is heralded by a small marginal plan in a map dated 1796 showing "plan of proposed wet docks" for the site now occupied by the West India Docks, and in the next map (1807) the docks are made, and at once White Horse-lane and its meadows are things of the past, and the long straight thoroughfare of Commercial-road marches clean over and through them. We were recently in one, probably, of the first houses built in consequence of this movement of the West-India Docks,—a good-sized square comfortable house, now abutted on each side by the smaller dwellings which line East-India Dock-road, but obviously in its day a dwelling-house of importance built by some ship-owner who wished to be near the scene of action, with a handsomely moulded and solid entrance-door, and a nearly flat roof covered with copper sheathing. To return, however, to one or two of the older plans that we have passed by, we notice in a large map called "London accurately Surveyed" (and dedicated to William and Mary, whose portraits adorn it), the first development of the Cavendish-square neighbourhood, little more than a square marked out, with one or two houses scattered about, and a congeries of fields in the rear, on which is the note, "These pastures were Marybone Park." In 1752 a good collection of houses has grown around Cavendish-square, though Marybone Pond, an oblong piece of water of regular shape and no great extent, remains northward of the square. In a map dated 1773 there is another instance in connexion with this district of those irregularities in nomenclature we have before adverted to; for, after having called the neighbourhood Marybone on the maps of half a century, we have suddenly a conscientious reversion to the origin of the name, and it is printed "Mary-la-bonne."

But we must break off these rather desultory comments here, though if there were time the maps themselves, independently of the views, might furnish matter for a whole number of this journal. We may just mention, in conclusion, that among items of great interest in this part of the collection, are some of the original sale plans of the land of well-known districts, showing their precise boundaries and characteristics at the time; among others, that of Grosvenor-place and the adjoining district.

ROYAL ACADEMY.

The President, Sir F. Leighton, delivered the prizes to the successful competitors amongst the students on Tuesday last. The works were very creditable, but will not be open to inspection, as the arrangements for the Winter Exhibition have to be proceeded with forthwith. The following are the Architectural Prize gainers:—

Travelling Studentship for One Year, with 130*l. Allowance:* Subject, "A Provincial Town-hall." Four competitors. Prize awarded to Mr. William Scott.

Medals for Measured Drawings: Subject, "Strand Gateway, Somerset House." Four competitors. First medal, R. W. Gibson; second medal, F. Baggallay.

Perspective and Sciography: Subject, "Porch of Temple Church." Two competitors. Medal, W. H. Wood.

SUBURBAN STREETS AND PAVEMENTS.

The paving question in some of the metropolitan districts is giving rise to much angry warfare in the local boards and to indignation meetings on the part of sections of the ratepayers. The question to be satisfactorily settled is, Who is liable for paving the footways in new streets: should the cost be paid out of the general rate or through a levy on the owners of the property? In Hackney now, as in Shoreditch and other parishes not long since, the paving difficulty is likely to lead to some litigation before the question is set at rest, although the law as stated in the 105th section of the Metropolis Local Management Act (1855) is clear enough as to the matter at issue. According to the section of the Act alluded to, it was laid down that the owners or occupiers of houses in new streets should first pave the front of their houses, and then the Vestry or District Board should keep them in repair for ever afterwards. In Hackney the District Board took over between 1855 and 1862 a large number of thoroughfares, and several of these had their footways paved at the public cost. In several instances persons had to pay their apportionments, while again in a number of other cases where houses were erected subsequently the cost of pavement has been paid out of the general rate. It is clear that the local authorities of more than one parish have attempted to play fast and loose with Acts of Parliament, and act according to their own sweet fancies. A case occurred in Shoreditch two or three years ago which went into Court. Certain occupiers in one of the wards fought the question of liability with the Shoreditch Vestry, and, after hearing the case, and consulting the Acts, the magistrate decided that the occupiers of the houses were liable for the paving. There can be no doubt that in the case of new thoroughfares the Acts of Parliament plainly and clearly provide that the prime cost of footway paving shall be paid by the owners. Should any difficulty arise in respect to getting at the owners, it is provided that the work may be done, and the cost levied upon the occupiers in instalments ranging over a number of years. It is worthy of notice that in the parish of Islington, in 1856, the year the Act came into operation, the local authorities put a number of streets in repair under the section. Though twenty-three years have passed since the Act came into operation, the local authorities in Hackney have allowed it to remain almost a dead letter.

The Hackney authorities are now contemplating a heavy loan, which will probably exceed a quarter of a million before the paving operations are finished. Large sums of money have already been expended for paving work, and the general rate has been put under contribution, instead of the cost being levied on the owners of property. We are certain that the Hackney authorities are committing a grievous injustice,—we will not say mistake,—because, with the Act before them, they must or ought to be conscious that they are in the wrong. Before they proceed further, they should reconsider their position, and discriminate between new streets and old thoroughfares. In Hackney, in several instances, first paving operations have been paid out of the rates, instead of by levy upon the owners of property. Unpaved thoroughfares through neglect are rapidly increasing by miles in Hackney yearly, and if the local authorities had done their duty by putting the provisions of the Act in operation years ago, they would not now be attempting to surmount the difficulty by doing what appears to be clearly illegal.

It may not be amiss to say here that Hackney, perhaps more than any other suburban parish, has suffered severely through the vile system of speculative or "Jerry" building operations. New streets were formed, but they never passed into the hands of the local authorities in a proper condition, for the building speculators and owners wasted little labour or materials on their formation. The new streets between the houses were robbed of their natural soil, sand and gravel, as well as the foundations of the houses on either side. Feculent rubbish and filth were shot down into depths ranging from 8 ft. to 16 ft., and a little top-dressing, cleverly spread, formed the surface of the new roads and pathways. The local authorities of Hackney have been constantly taking over into their care roads and streets of the kind described, and paving them at the ratepayers' expense. Take one of a sample of new roads in Hackney, whose footways have just been paved. Three years ago a couple of "Jerry" builders, one of them a member of a local board, took a piece of Crown land. A number of houses were erected, the sand being robbed from beneath the foundations and the road, or the space intended for the new road, in front. The usual filthy filling-up process took place. While the houses were being finished, and the majority of them sold or let, the road was made up with rubbish. The footpaths were formed and kerbed after a manner, but in less than six months the roads and footpaths sank and undulated, as if a small earthquake had shaken their foundations. In a few months more the kerbstones for the greater part of the length of the road disappeared below the surface of the footpath. A few weeks ago the roads and paths were in a wretched condition, and the local authorities commenced to make up the footways by laying down asphalte pavement. In this instance, however, an apportionment was made on the owners of the houses; but in other parts of the parish, where roads and portions of roads were similarly treated by speculative builders, the footpaths were paved at the cost of the ratepayers.

When speculative builders and first owners of house property are allowed to act in the manner we have described, there will be plenty of paving operations for years to come at the ratepayers' expense in Hackney and other parishes. Several owners of property, too, in new streets, from the original bad formation of the roadways, are likely to pay more in apportionments for paving than they should had the local authorities in the first instance performed their obvious duties.

We might dwell more on the side bearings of the paving question in the suburban parishes, but on the question of liability we think we have said sufficient for the present.

SEWAGE AND IRRIGATION WORKS IN GERMANY.

In continuation of our former article on this subject,* we now proceed to consider the case of the German capital. The drainage of Berlin has been a most difficult and complicated subject for the engineer. Until 1873,—when the necessity for doing something in the matter of the general drainage of their city was recognised by the corporation, and the work of canalisation commenced, — the capital was without any properly regulated system of drains and sewers. It is true a number of schemes had been proposed, and for various reasons, some of a technical, others of a financial nature, rejected; the earliest proposal dating from 1816.

About twelve years ago a plan for the drainage of Berlin was submitted to the authorities by Herr Geheim-Oberbaurath Wiebe. In this, *one* system of sewers for the whole city was projected, with a main outlet in the river Spree near Charlottenburg. Berlin being very flat, and only a few feet above the level of the river, the execution of this project,—a main sewer necessarily falling from end to end of the city (with provision for future extension in all directions),—the subsoil being running sand, permitting water to percolate in large quantities, would have been attended with great difficulties and enormous expense, and was consequently also rejected.

The project of Herr Baurath Hobrecht, adopted in 1873, and now being carried out, however, is based upon what is called in Germany the "radial" system,—a system eminently suited to the special circumstances of Berlin, besides preventing the pollution of the river, the sewage being ultimately used for irrigation purposes. There are five systems of sewers, each with a pumping-station, and each starting from the centre of the city and running in a different direction.

The many advantages of this plan are at once apparent. The main sewers are, as a great depth is in no case necessary, comparatively easy to execute; the branch sewers in proportion. As any extensions can only be necessary in the periphery, the works in the central (built-upon) area have an unusually permanent character, and are never likely to be subject to alteration. The extensions necessary can easily be connected without any interruption to the trunk systems. The height the sewage has to be pumped is much reduced. It is undoubtedly also an advantage that the authorities are in no way bound to any one particular site or direction as to irrigation areas. Besides these advantages, the dangers of serious flooding, accidents, disturbances, &c., are greatly lessened by this division and distribution.

The works in Berlin are approaching completion. Already two radial systems are working, so far as pumping operations are concerned, and already for two seasons irrigation has been carried on, and with most satisfactory results. It is to be hoped that the Metropolitan Board of Works will one day take courage, and address to the municipal authorities of Berlin an official inquiry on the subject.

The irrigation area for the three systems on the south side of the Spree is distant from the various pumping-stations about eight miles. In order to reach the fields by gravitation, the sewage has to be lifted at the stations nearly 65 ft. In the middle of this year the amount of sewage passed through the pumping-station of the radial system No. III. was nearly 240,000,000 gallons per month, which is only about the sixth part of the maximum capacity of that station.

The irrigation farm of Osdorf comprises, in round numbers, about 2,000 acres, of which at present about 500 acres have been adapted for irrigation. Of this area, 225 acres are grass land, 150 acres are used for market-gardening, while 125 acres are covered by shallow reservoirs, serving for storing provisionally the sewage during winter, should severe weather involve a stoppage of the irrigation. The irrigation ground is undulating, rising in some instances 40 ft. The delivery-pipe is carried to nearly all higher-lying points, where there are outflow-holes with ordinary slides. The steeper slopes are covered with Italian rye-grass, while the more level ground is used for vegetable-growing, and for this purpose formed into terraces, with narrow raised beds, divided by trenches, from which the water penetrates laterally to the roots. The paths between the fields are planted with fruit-trees, the luxurious growth of which, combined with the even more than luxurious look of the fields, imparts a most satisfactory impression.

The irrigation area at Osdorf has been acquired at an expense, including the laying out of the farm, of 125,000*l.* (over 60*l.* an acre). The total cost of the draining and sewerage of Berlin is estimated at 2,000,000*l.* There will be two sewage-farms on the north side of the River Spree, when the drainage of that part of the city is once in working order.

Strange to say, the project was at first looked upon with most unfavourable eyes by the rich as well as the poor of the German capital; but what is stranger still, the municipal authorities of Berlin, as those of other German cities where sewage and irrigation works have been projected, met with but scant encouragement from the Government. However, the beneficial effects are already appearing, in a direction, too, in which the poorer classes of Berlin have hitherto been great sufferers. Leaving out of the question the improvement in the sanitary condition of the city,—which, of course, is by itself a highly important factor,—the Berliners are already reaping substantial advantages. The success of market-gardening on the communal irrigation farm, the excellent quality of the vegetables of all descriptions grown there, has sent down the prices of those indispensable commodities wonderfully. "When once the works are a few years older, when a little more experience has put them more in working order, especially when gardeners practised in the systematic cultivation of market-gardens have been engaged," writes us a correspondent intimately acquainted with Berlin, "the Berliners will not be long in turning enthusiastic defenders of the welcome little stranger, formerly very much ill used, which has brought them clean streets without open gutters, pure air, salubrious water-closets and courts, and good vegetables and milk, which will now also be within the reach of the poor man."

A few words in conclusion as regards sewage and irrigation works, with which waterworks are closely connected, in Germany. People in that country are gradually becoming alive to the fact that the health of towns *may* be improved by the supply of pure air and pure water. Witness the numerous works undertaken with this view, not only in the larger cities, but also in smaller towns, the mere mention of which would make up a very respectable list. Of the more populous cities, besides the two which form the subject of this article, the cases of Breslau and Munich may be cited. As

* See p. 1267, *ante*.

regards Breslau, the sewer system, on which Messrs. Aird, of Berlin, have been engaged during the last few years, will be completed in 1879. Sewage irrigation is to come into operation there on the completion of the works. The lands are already being prepared for irrigation.

With respect to Munich, plans for the sewerage have been prepared by J. Gordon, C.E. (formerly of Carlisle). The execution of those plans involves an estimated expenditure of 734,000*l.*, and they are now being revised by Herr Geheimrath Wiebe. A deputation of the Munich magistracy recently spent some days in Danzig, inspecting the works there and visiting the farm. Departing, they expressed the most thorough approval of the system and the arrangements.

ARCHITECTURE IN AMERICA.

The twelfth annual convention of the American Institute of Architects was held last month in New York. Mr. Walter, the president, in his opening address, said,—

The progress of architecture during the past year has been quite in sympathy with the times. A period of financial depression, such as our country has passed through since our last annual convention, is by no means calculated to promote the development of architectural science. Some works of importance have been commenced, but not many; and others that were begun in better times have continued in progress of execution, with satisfactory results. Much has been done during the year in our large cities, in the construction of residences and buildings for business purposes, the most of which bear the impress of independent thought in architectural composition, and it is not to be doubted that the development of the genius of design is becoming every year more apparent. While it is true that we as architects recognise with satisfaction the progress of our art, it should be borne in mind that we do not expect everybody to admire what everybody else does. Our tastes, fortunately, differ in regard to the æsthetic handling of most of the works that come under our notice; but that difference is the life of our art. If, in the processes of architectural design, we all thought alike, our works would be devoid of individual inspiration, and a wearisome monotony would pervade all manner of buildings. It is therefore well for our art that differences of opinion in matters of taste exist among its professors, provided the individuality that characterises our respective works is the outgrowth of genius and cultivation. We have, unfortunately, some specimens of building in our principal cities, which, so far from exhibiting progress in the artistic manipulation of material forms, remind us of the primitive efforts of a barbarous age, carrying us back to Ellora, Elephanta, or Uxmal. It is, however, a satisfaction to know that such eccentricities are comparatively few. As the masses of the people become more imbued with intelligent conceptions of art, whatever fails to develop the good, the true, and the beautiful will cease to be tolerated. After all, it is to the education of the public mind in what constitutes the genius of architecture that we are to look for the suppression of crude and inartistic building, and the promotion of a taste that will do honour to the age in which we live.

* * * * *

In the works of the recent past a decided improvement in the structural character of buildings is noticeable. More attention than heretofore is being paid to the permanency of foundations, and to the scientific elements of construction, thus affording conclusive evidence of the value of the improved architectural training which students now enjoy, and of the increased attention of architects in general to the sciences which underlie the art of building. The pursuit of knowledge in this direction, both in and out of the profession, is, no doubt, mainly to be attributed to the Institute and its chapters. It is, however, to be regretted that we are not yet without occasional examples of imperfect building, some of which have resulted in serious disaster; but it should be remarked that in most, if not in every instance, the faults have been traced to unskilful superintendents and unreliable contractors, rather than to the architects from whose plans they are constructed, and who in most instances had no control over their execution. Architects are frequently called upon to furnish designs for buildings, with detail drawings and specifications, with the understanding, implied or expressed, that in order to save a portion of the full commission of five per cent. on the cost of the work, their services in the direction and execution of the design will be dispensed with; such economy is "penny-wise and pound-foolish," as it seldom fails to result in defects in carrying out the plans, as well as in a greater expenditure than would have been incurred had their author's design been properly executed; and what is still more, the false economy referred to has in some cases, resulted in serious disaster. It must, nevertheless, be borne in mind that an architect is always considered by the public as responsible for his designs, whether he is employed to see them executed or not. Should they be committed to unskilful hands, and be mutilated *ad libitum*, and so imperfectly executed as to result in a want of stability, he need not expect that public opinion will exonerate him from a certain degree of blame, however perfect his design of construction may have been. Not only is the permanency of a structure affected disadvantageously by intrusting its execution to irresponsible mechanics, without professional guidance, but its architectural proportions and appointments are sure to be hardly dealt with.

A paper by Mr. Littel on the use of brick in decoration provoked considerable discussion on the relative value of brick and terra-cotta as building materials; and others were read, on the metric system, on the faults of American architecture, and on plumbing.

A report was received from the Committee of Ways and Means, suggesting the value of a technical examination as a qualification either for membership or for professional practice, and proposing means to secure the interest of the younger members of the profession by prizes or other appeals, and to increase the importance of the conventions.

The other things which occupied the convention were chiefly matters of domestic business or discipline. The old officers and committees were re-elected with a few exceptions, of which the chief was the election of Mr. Charles D. Gambrill as secretary, in place of Mr. McKim, who declined to serve another year.

The conduct of architects in competitions led to considerable discussion. The following resolutions were passed:—

"That any member of this body who, in case of competition, should propose or agree to undertake the work for which he is competing for a less commission or compensation than his fellows in the competition, violates the sole condition of membership of this society, viz., 'the honourable practice of his profession;' and that upon proof of the fact to an investigating committee, which shall consist of three Fellows, who shall be appointed by the Board of Trustees upon the demand of two Fellows of the Institute, he shall be declared to be expelled by the Board of Trustees, without further action of the Institute as a body, and that such expulsion shall expel him also from the chapter."

"That if in case of paid competition any member of this Institute shall offer his services free of charge, he shall be liable to censure, if charges are made by two Fellows and a committee appointed as provided in a former resolution, for censure for violation of the conditions of membership in the Institute."

ADDITIONAL WATERWORKS, VIENNA.

The high-level waterworks of Vienna were completed in 1873 by the contractor, Mr. Gabrielli. Although the expenditure had been enormous, it was found after a very short time that the supply of water fell much below the quantity required, the want of that necessary commodity making itself felt especially in winter during severe frost. In consequence, a committee was appointed by the Vienna municipality, charged with remedying this state of things, by opening up new springs. It was soon found, however, that this extension would not have the desired effect; the supply, under those conditions, would still have remained precarious, and would have required for its realisation, in consequence of large additions to the supply area, &c., several years to complete. It was then that an offer was made by Messrs. J. and A. Aird & Mare, the Berlin firm of engineers, in conjunction with Herr Carl Freiherr von Schwarz, to the municipality of Vienna to undertake the works necessary for ensuring a regular supply of 300,000 eimers (4,500,000 gallons) daily for the city. This quantity was considered amply sufficient for the wants of Vienna, and the contract accepted.

It had been suggested already in an engineers' report presented in 1875, and based upon the inquiries made by a water supply committee in 1864 and subsequent observations by engineers, that the currents of underground spring-water which run through the gravelly basin of the Schwarza valley could be best made available for the additional quantity required for supplementing the high-level works. Up to the present time, the principal point to be decided with respect to the storing, raising, and conducting the supplemental supply to the present high-level works was the selection of the most suitable site, as well as instituting inquiries with regard to the quality and quantity of the underground spring water. Careful investigations pointed to the neighbourhood of Pottschach as the most suitable spot, not only on account of the quality of the water,—it is there so cold (already at a low depth 3½° to 5° R.) that the inhabitants, as a proof of its excellence, are in the habit of keeping everywhere trout in their wells,—but also because of the favourable position of the locality to the aqueduct of the high-level works.

The water is pumped out of four deep wells, and carried in two sets of pipes 24 in. in diameter to the high-level works. The cost of the new works amounts in round numbers to 60,000*l.*; their capacity exceeds already the guaranteed quantity of 300,000 eimers. The works are expected to be in operation before the end of this month.

NEW VICARAGE, FOREST GATE.

The new vicarage at Forest-gate, Essex, view and plans of which are given in our present issue, is now approaching completion.

Architecturally, it is very simply treated, not a single moulding or chamfer, either in brick or stone, being introduced in any of the fronts. The aim appears to have been to gain a certain effect merely by the disposition of the lines and the solidity of the work. Internally, also, the finishings are to be of a modest kind.

The design is a modification of the Queen Anne style, very plain in character. The building is faced externally throughout with red bricks, with white brick bands on the back and side fronts; and on the main front has solid, plain stone dressings, and stone bands, a blue brick base, and a few blue bricks in patterns. The roof is covered with Broomhall tiles, of a brownish tint. The walls on the south and west are built hollow, the hollow spaces being also utilised for ventilating purposes. As regards the plan, a few slight modifications have been introduced in carrying out the work.

Mr. Joseph Page, of Spitalfields, is the contractor, and the work is being executed from the designs and under the superintendence of Mr. George McDonell, architect.

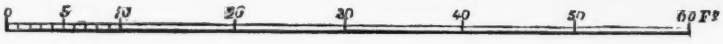
The total cost, exclusive of boundary-walls, will be about 2,263*l.*

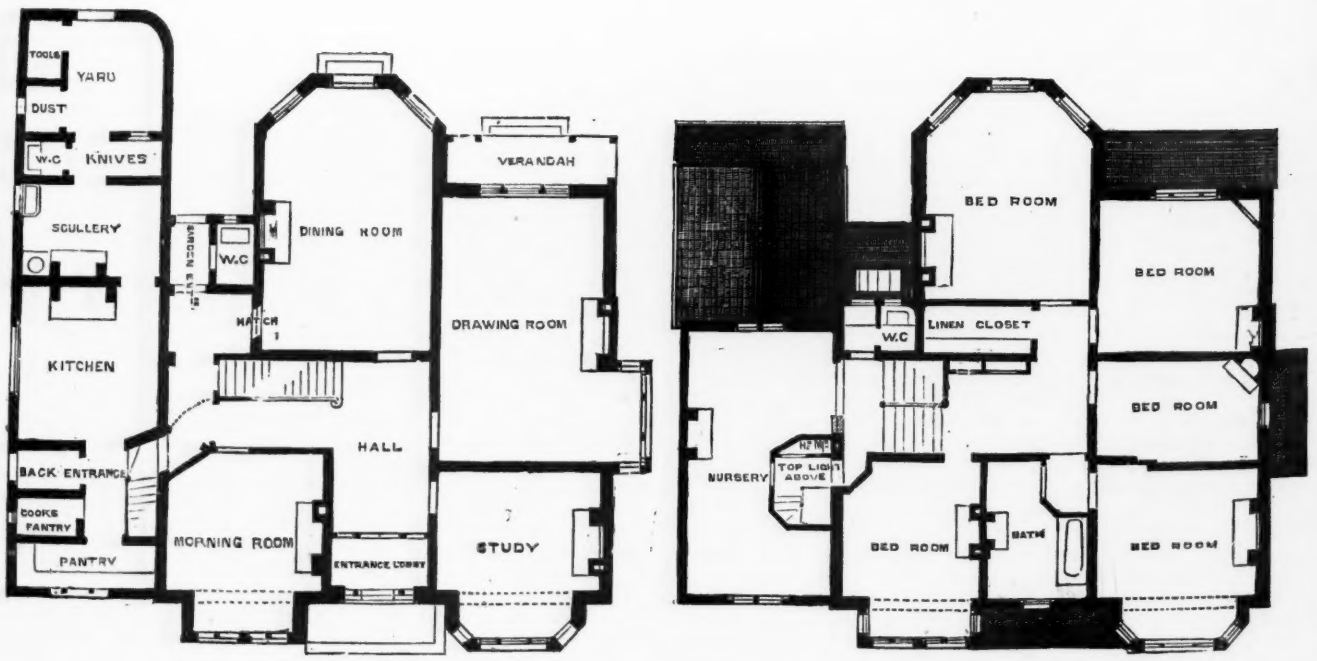
ACCEPTED DESIGN FOR THE INTERNATIONAL EXHIBITION BUILDING, MELBOURNE.

In the last session of the Victorian Parliament the Government introduced a Bill to provide for holding an International Exhibition in Melbourne, and to furnish the means for erecting the necessary buildings, &c. That measure the Legislative Council rejected, but not before competitive designs had been invited for the proposed building by the commissioners appointed. A number of designs were sent in, and the commissioners, having undertaken to award prizes in terms of their advertisement, have assigned the first to that depicted in our illustration, which is by Messrs. Reed & Barnes, architects, Melbourne.

The site on which it is proposed to erect this structure is at the south end of the Carlton-gardens, fronting on Victoria-parade. Nothing more wonderful than the growth of Melbourne and the other cities of the Victorian colony is known. Look at a view of Melbourne, such, for example, as that lately published in a special number of the *Illustrated Australian News*, and remember that the actual founder of that city, John Fawkner, died no longer ago than 1869, and the truth of this assertion becomes obvious. Where a few lone men encamped in 1836, there is now a city of 300,000 inhabitants, with fine buildings of all kinds, and an International Exhibition in course of arrangement.

Messrs. McLaren's Sale.—A correspondent, signing "R. S. D.," writes to deny that the Glasgow Bank had anything to do with the failure of Messrs. McLaren & Co. We may add that the auctioneer engaged was Mr. Henry Bourn.

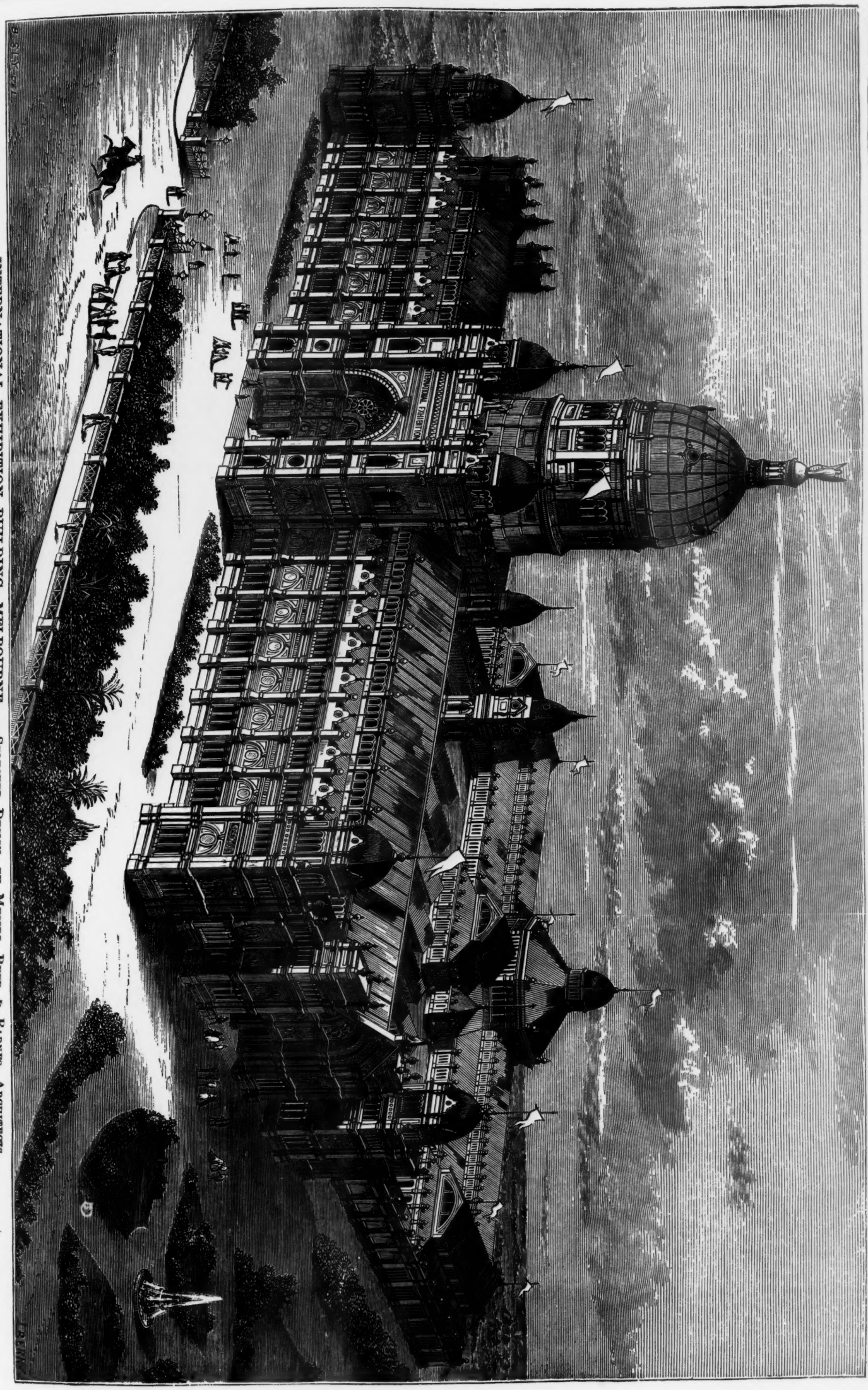




GROUND PLAN CHAMBER PLAN

R. F. Whellock.

NEW VICARAGE, FOREST GATE, ESSEX.—Mr. George M'Donell, Architect.



INTERNATIONAL EXHIBITION BUILDING, MELBOURNE.—SELECTED DESIGN, BY MESSRS. REED & BARNES, ARCHITECTS.

THE HIGH SANCTUARY AT JERUSALEM.*

THE next question which requires to be considered is that of the position of the Temple itself and its inner courts within the Haram; and a few remarks on this question may perhaps find a proper place as a sequel to the preceding account of the High Sanctuary.

Mr. Fergusson proposes to confine the Temple to a square of 600 ft. side in the south-west part of the Haram enclosure, but it seems to me, with all deference, that such a theory is open to several grave objections: 1st. The south Haram wall is, as above shown, 922 ft. in length, and the master-course runs unbroken beyond the limit proposed by Mr. Fergusson. 2nd. The junction of the Ophel wall at the south-east angle also seems to point to the east wall of the Haram as being the old east wall of the Temple, and the Double and Triple Gates correspond to the two Huldah, or "Mole Gates," of the Temple, according to the Talmud. 3rd. The north-west corner of Mr. Fergusson's enclosure is placed where the rock is 100 ft. lower than the Sakhrah; thus there is no possibility of the existence of a rock-scarp at this point, such as is required for the site of Antonia. 4th. Foundations would, on Mr. Fergusson's hypothesis, be required for the Holy of Holies, which would be from 60 ft. to 90 ft. deep, in order to give to the floor of the Temple the requisite elevation (as given in the Talmud) above the outer court. 5th. There are no remains of ancient rampart walls on the lines where Mr. Fergusson would draw the north and east boundaries of the Temple. 6th. The dimensions in the Talmud give an area considerably greater than that of 600 ft. square, proposed by Mr. Fergusson. These six main objections seem to me to render the proposed restoration improbable, as not fitting with the facts now ascertained.

The only way in which the sections of the Temple can be made to fit with the ground in the Haram, is by placing the Holy House itself in that part where the rock is highest; in fact, on the "top of the hill," where Josephus says that the Temple stood. The spot in question has been shown to be the Sakhrah, and the Sakhrah is traditionally the site of the Holy of Holies. This hypothesis was first put forward by Dr. Chaplin, of Jerusalem, in a letter to the *Athenæum* in 1877. There are many indications of the correctness of such a restoration; the first and most important being the satisfactory result with regard to levels, as will be seen by referring to the section east and west. In drawing that section, I have assumed, for reasons which there is not now time to explain, that the cubit was about 16 English inches in length. Mr. Fergusson takes its length to have been 18 in.; but the difference would not materially affect the results, though a 16-in. cubit seems to give greater exactitude. A cubit of 21 in. or 22 in. has been proposed by other writers; but the Talmudic statements will not, I think, allow of this; and one very evident objection to such a unit is, that it would make the rise of all the steps in the Temple 11 in. (half a cubit), which seems far less probable than 8 in. or 9 in.

The section shows how well the levels of the various courts agree with the gradual slope of the rock, as deduced from various observations along the line. The greatest depth of solid foundation required is about 8 ft., and this is beneath the Holy House itself; where, as we learn from Josephus, a solid masonry foundation did actually exist. Under the Court of the Priests, the rock is about 15 ft. from the original surface; but we learn from the Talmud that exactly in this part of the Temple there was a vault beneath the higher court opening into the lower court, or Court of the Women.

Another valuable indication is given by the number of steps which led from the various Temple gates. Those on the north and south had ten steps each, giving a rise of five cubits, or 7 ft. The eastern gate Nicanor had fifteen steps, giving 7½ cubits, or rather over 10 ft. rise. The levels thus obtained fit exactly with the ground according to the present hypothesis.

There are many other indications of the satisfactory nature of this restoration, of which the following are the most striking:—(1) The centre line east and west through the Holy House will, if produced, strike the summit of Olivet, and it is expressly stated that the high priest on the summit of that mountain could look straight into the Holy House. (2) There were no cisterns within the area of the Temple courts,—the water was obtained from without. The existing cisterns are all outside the boundary of the courts, according to the present plan. (3) On the north-west of the Priests' court was the great gate-house called Moked, where was the watch-fire of the priests. It is described in the Talmud as being "on a level," and occurs on the present plan in a place where the rock is about the same level inside and outside the gate. From the chamber west of this gate there was an underground passage running beneath the *Bireh*, which seems to have been the passage leading from Antonia to the Temple, according to Josephus (*Baris*, the old name of Antonia, being probably the same word as *Bireh* or "fortress"). Now, from the position proposed for Moked, a rock gallery does actually run north for about 130 ft. towards the great rock scarp of Antonia, and corresponds to the tunnel from the Double Gateway on the south.

But yet further. The passage from Moked led to a gateway called *Tadi*, or "obscurity," and thence to a large bath-house. Now on visiting the rock gallery mentioned above in 1874, I was able to ascertain that the north end is not cut in rock, but is closed by a rude massive wall—the passage runs on further; and the same fact I also ascertained in another rock gallery (No. 3 Ordnance Survey) west of the one already mentioned. It is not improbable that these two galleries run on to join, and their directions, if produced, meet at one of the entrances to the platform, which is called "the arcade of *El Atm*, or 'obscurity,'" thus retaining the name of the old gate *Tadi*. Another indication is obtained by the position of various gateways on the platform, which seem at present to be arranged without any system, but which are all on the production of the lines from the old Temple gates. Moreover, the entrances to the outer inclosure mentioned by Josephus and in the Talmud were eight in all—four on the west, two on the south, one on the east, and one on the north. Now on the present plan it will be seen that a great passage cuts the west wall of the Haram north of that from the Prophets' gate, and this probably represents an ancient gateway. North of this again is a modern gate which retains the old name of "Iron Gate," mentioned in the Bible as that of the gate leading from Antonia to the city; thus, including the entrance over the great bridge on the south-west, we have four western gates. The Double and Triple gates on the south are the two mentioned as Huldah Gates in the Talmud, but the actual remains of the northern gate *Tadi*, and the eastern gate *Shushan*—which was just opposite the Holy House, require still to be discovered.

Such, briefly stated, are the main arguments in favour of this proposed restoration of the Temple. A theory or hypothesis is convenient, and indeed necessary in many cases, as a nucleus round which to group facts, and to give system to exploration; but a hypothesis is merely the scaffolding by which the edifice is erected, and which disappears when the work is complete. It is to be hoped that future exploration will some day enable us to dispense with theories; meantime the preceding remarks may perhaps be of some value as indicating the direction in which we should work. The practical lesson for the future, which seems to me to be taught, is the importance of discovering what lies hidden beneath the platform on which the Dome of the Rock stands. There are many other points where exploration is desirable,—as, for instance, along the north wall of the Haram along the north side of the platform, and outside the east wall at the point opposite the site of the Holy House, in order to find the old east gate of the enclosure; and again, on the north-west of the Haram, to trace the limits of the great rock scarp. But of all explorations, those beneath the flagging of the platform would be the most interesting. In 1873 I found towards the west of the platform, in a chamber the floor of which is of rough rock, a finely-worked vertical scarp cut in rock, and over 7 ft. high. No doubt the platform conceals many such foundations, and from them we might, perhaps, determine more exactly the ground-plan of the Temple. To excavate beneath the platform is at present impossible; but there is one point where exploration might perhaps be practicable,—namely, in that unknown vault on the east of the platform, the closed entrance to which is still visible; and if the restoration above proposed for the Temple be correct, this point is one of extreme interest, as it is possible that the south-west corner of the lower Court of the Women, and the foundation of the upper Court of the Priests, still exist beneath the modern platform inside this vault.

The second portion of this paper is to be devoted to the buildings within the area of the High Sanctuary, dating after the Christian era, especially the Mosque el Aksah, the Golden Gateway, and the Dome of the Rock. In venturing to dissent from the conclusions which Mr. Fergusson has published as to the origin of these buildings, I do not wish it to be thought that I undervalue his great architectural experience. I merely hope to point out facts discovered since the time when his theory was first published, and to submit them to the judgment both of himself and of other experts. Mr. Fergusson is of opinion that the Dome of the Rock was originally built by Constantine, and that the Cave in the Rock is the true sepulchre of our Lord. With regard to the second hypothesis it may be remarked that if the temple stood on the Sakhrah, the true sepulchre of Christ cannot have been situated there also. With regard to the first and distinct question, where did Constantine build his church?—the main objection, out of the very many to Mr. Fergusson's theory, lies in the numerous topographical descriptions of Jerusalem in the fourth and fifth centuries, which place Constantine's church in the middle of the city, and north of Sion; while the Arab historians agree with the Cufic inscriptions on the Dome of the Rock, in attributing that building to the Caliph 'Abd-el-Malek, in the seventh century.

In the fourth and fifth centuries the Haram area is described as lying waste, with the Twin Pools on the north, and a "pinnacle" on the south, which appears to have been that part of the old wall at the south-east corner where the ancient masonry still reaches up some 40 ft. above the ground, and which before the walls were rebuilt must have stood up alone,—a conspicuous object. In the sixth century, however, a basilica erected by Justinian is mentioned by one chronicler, and we learn from Procopius that this church, built in 527 A.D., was founded partly on the ground and partly on vaults, and that the masonry was only inferior in size to the ancient Jewish masonry. The basilica had three aisles, and each aisle had a door. In the Aksah mosque the remains of such a three-aisled basilica have been traced by M. du Vogüé, and among the various capitals of the columns many have been found closely resembling in character those in the church of Kalb Louzeh in the Haurân, which was built in the sixth century. The vault which runs beneath the Aksah is of fine undrafted masonry, and the roof has the peculiar characteristic of Byzantine vaulting, — a narrow keystone and broad haunch stones,—which is observed in all the early convents in Palestine. The small side doorway, with a low relieving arch above a lintel, found in the west wall of this same passage, also presents a common Byzantine construction, and the mouldings of another doorway are compared by M. du Vogüé to those of a doorway at Khakkah belonging to the sixth century. The chamber immediately within the Double Gate is, however, older. It is roofed with four domes with pendentives supported by massive monoliths, which can scarcely be girthed by three men's extended arms, reminding us of Josephus's description of the Temple columns. This gatehouse is by general consent attributed to the Herodian period, and the details of the tracery on the domes, the vine pattern and other designs, are akin to the ornamentation of the rock-cut tombs of the first century in Palestine. The gatehouse has, however, been altered at a later period; the faces of the stones in the side walls have been cut back so as to obliterate the drafts. Relieving arches have been turned over the great lintel stones (one of which is cracked) and pillars of semi-classic character have been placed beneath them. The relieving arches date later than the time of Hadrian, as is evidenced by the inscription bearing that emperor's name built in upside down into the wall close to the arch. At the time at which these restorations were made, a kind of cornice with an arched soffit appears to have been also built in above the lintels. Its details reproduce those of the Golden Gateway so closely as to leave little doubt as to their belonging to the same period, and a few words may be ventured on the question of the date of these two buildings.

The Golden Gate does not appear to have been one of the ancient temple gates. The

* By Claude R. Conder, Lieut. R.E. Read before the Royal Institute of British Architects on the 2nd inst. See p. 1269, *ante*.

level of its sill is considerably higher than those of the ancient gates, and the whole of its masonry appears to be of later style. Mr. Fergusson compares this monument with the Golden Gate at Spalatro, and refers it to the fourth century; M. du Vogüé compares it with the churches of El Bârah, Kalb Louzeh, and Khakkah, in the Haurân, and gives drawings of details which are almost identical with those of the Jerusalem example. With reference to this question, it may be noted that the archivolt, or architrave deflected into an arch, which is the main feature of the Golden Gate, is found in the Haurân (or close to Palestine) in the sixth century, but that it is not used in the only undisputed fourth century building in Palestine, namely, Constantine's Basilica at Bethlehem. It seems safer to form a judgment from examples in the immediate neighbourhood than from European examples, and the character of the columns which support the roof of the Golden Gateway may perhaps be cited as indicating late date, for their capitals have the heavy ram's-horn volute, which in Syria is commonly found in the pseudo-Ionic capitals of the fifth and sixth century buildings. The Golden Gateway and the restorations of the Double and Triple gates are apparently of one date, and it remains for architects to decide whether these monuments, together with the fine undrafted ashlar in the walls, and the tunnel vaulting of many of the Haram passages, are not to be attributed to Justinian, who is said to have boasted that he had surpassed Solomon.

The Aksah contains remains of various dates. There are the fragments of the old mosque enlarged by 'Abd el Melek, in 691 A.D.; the cupola is dated 728 A.D.; and there are traces of a Crusading apse, and of the Templars' Hospital, belonging to the twelfth century, while the façade, with its bold dog-tooth mouldings and broad pointed arches, is referred by M. du Vogüé to the thirteenth. Capitals of Classic design are found in the interior, and bulging basket-work capitals, evidently Byzantine, while in the so-called "Station of Omar" there are beautiful and intricate capitals, carved with leaves and dragons in high relief, which are evidently of Crusading origin.

In 637 A.D., about a century after Justinian, the caliph Omar visited the Haram. He entered through the Prophets' Gateway, and visited the basilica. He found the *Sakhrah* covered with rubbish, and caused it to be purified. He afterwards built a square wooden mosque beside it. In 688 A.D., according to the Arab historian Mejr-ed-Dîn, the caliph 'Abd el Melek addressed a letter to his subject inviting subscriptions for the rebuilding of the Haram. He began, according to this authority, by building the Dome of the Chain, and was so pleased with it that he replaced Omar's wooden building by a *Kubbeh*, or "domed building" on the model of the Dome of the Chain built round the *Sakhrah*. The same caliph also enlarged the Mosque el Aksah, and built fifteen chapels in the Haram.

Such is the account of the Arab historian, and in corroboration we find a Cufic inscription within the present Dome of the Rock, which gives the same date, 688 A.D., as that of the erection of the building. Against this view of the subject, Mr. Fergusson urges,—first, that the form of the building—an octagon—is never used by the Moslems in any age for a mosque (I think that is a very strong objection); and secondly, that the style of the building is Byzantine, and that the Dome of the Rock must have been built in the fourth century, judging from its plan, its round arches, the pillars supporting the dome, and the beam joining the pillars in the screen. These are, I believe, the details to which Mr. Fergusson specially calls attention, as later discoveries have induced him to reconsider his observations regarding the present bases of the pillars and the wooden ceiling of the building.

With regard to the first of these arguments it may be pointed out that a considerable confusion has arisen in the nomenclature of the Haram, and that the Dome of the Rock is commonly called the "Mosque of Omar," a title properly belonging to part of the Aksah. The Haram es Sherîf, or "High Sanctuary," also called "Masjid el Aksa," or "remote praying-place" (remote, that is, from Mecca), contains only one mosque, the Jâmia el Aksa, or "meeting-house of el Aksa," on the south wall. It contains also many *Kubbehs* or "domes," of which the Kubbet es Sakhrah is one. They are not mosques, and no regular service is held in them; they are shrines built over sacred spots, and as at Damascus and in Egypt, so here, a round or polygonal building, with a dome above, is employed to shield the sacred locality. The Dome of the Rock may be compared to the "Dome of the Books" in the Damascus mosque, and the fountain in the Mosque of 'Amru at Cairo is covered with a similar polygonal domed building. There is no building in the Haram really built for a mosque. The form of the Aksa is not convenient for Moslem worship, and mosques originally built as such are rare in Syria (though a good example is to be found at Acre) because the Moslems found the shape of the Crusading churches specially adapted for mosque worship, —a *mihrab* being constructed in the side of the building looking south, thus allowing long rows of worshippers to stand in line facing Mecca. In the Aksa the length of the original basilica is directed north and south, and the worshippers are obliged to stand one behind another, and are less able to follow the motions of the fuglemen in front.

Turning next to the question of the plan of the Dome of the Rock, one cannot fail to recognise a general resemblance to the Dome of the Chain, except in respect of the outer wall of the larger building. The Dome of the Rock has a circular drum rising from twelve pillars and four piers, while a screen outside this circle springs from sixteen pillars and eight piers arranged in an octagon. The outer wall has also the octagonal form, and the measurement from angle to angle through the centre of the building is 176 ft. from outside to outside. The Dome of the Chain has an octagonal drum supported on six pillars, and a screen supported on ten pillars. It will be found that the diameter of the Dome of the Chain is almost exactly two-fifths of that of the Dome of the Rock, measuring to the octagonal screen, and that the heights to the top of the two domes have the same proportion. The proportions of the Dome of the Rock will probably strike any observer as giving too great a breadth for the height; thus we are led to ask whether the outer wall may not be a later addition, and in corroboration of such a supposition we find that while the screen has on it an inscription dated A.D. 688, the doors of the outer wall have the date A.D. 831 in the Cufic inscriptions on their leaves, and the beams of the ceiling above the wall bear the date A.D. 913. As far as concerns the plan of the buildings, there seems, therefore, no great difficulty in accepting the Arab account, which makes the Dome of the Chain the model whence the Dome of the Rock was built, if we suppose the outer wall of the latter to be a later addition.

We may next consider briefly the details of the two buildings, especially the pillars, the arches, and the wooden tie-rods between the columns. It may be noted generally that these buildings, if the Arab historians are trustworthy, belong to a very early period of Moslem art. It may be easy to compare them with Byzantine buildings, but it is almost impossible to find contemporary Arab examples. The Mosque at Damascus, belonging to the same period, is merely a converted basilica like the Aksa: and the Mosque of Amru, Mr. Fergusson informs us, has been rebuilt, so that it is doubtful whether any of the original work remains. Whatever, then, be the style of the two buildings now under consideration, it cannot be positively said that such a style was not used by the Caliph Abd el Melek, because no examples are known of his style which can be contrasted with these his supposed erections. If, moreover, there is any striking structural resemblance in the details of the Dome of the Rock and Dome of the Chain, we should hardly conclude that the one is the work of 'Abd el Melek, but that the other is nearly 400 years older; for, to say the least, such a conclusion would be unnatural in the face of the historical evidence. If it be possible that the Caliph built the Dome of the Chain, it is equally possible that he built the Dome of the Rock, if it is shown that the two have a similar plan and a similar style in their details?

The pillars in the Dome of the Chain are of various design, but, generally speaking, of semi-Classic or Byzantine outline, and appear to have been taken from some older building. They are tied together by a wooden beam above the capitals, and semicircular arches spring from them. The pillars in the Dome of the Rock are also of various design, and of Early Byzantine character. A wooden beam runs above them, and semicircular arches spring from the beam. The varied character of the columns can be judged by the sketches given in illustration of this paper. I have several times examined both the inner and the outer circle, and made sketches of all the capitals and of several bases. Only three of the capitals under the drum are alike, the rest differ in size, in outline, and in details. The capitals also differ in their state of preservation, but in most cases the volutes and acanthus-leaves have been much defaced, the projecting edges having been knocked off. One of the capitals is evidently placed on a shaft which did not originally belong to it, but which requires a larger capital. The sixteen capitals in the screen are more uniform, and twelve of them differ only in the device between the volutes, one of which devices has been thought to represent a cross, though possibly it is only a trefoil. Two of the capitals in this line are, however, of entirely different design, and the shafts supporting them are longer than the other shafts. Above the pillars in the screen are blocks now covered with thin marble veneer. In 1874 the construction of these blocks became visible, and it was seen that they surround smaller stone blocks which are square and quite plain. The spaces between are filled with rubble. The blocks above the two capitals, which stand on the longer shafts, are only half as deep as those above the other capitals, so that all the arches spring from one level. There is a difference of several inches in the diameters of the various shafts of the columns. The shafts do not rest immediately on the bases but on layers of lead, differing from 1½ in. to ¾ in. in thickness. The original bases are now covered up with marble flagging, but this was removed in 1874, and it was then found that the bases also differ in outline and in height, one being only 4 in. high, a second 12 in., and a third 17 in. It is clear, then, that the columns and their bases and capitals are of a very heterogeneous character, and that they were probably taken from some other building and not expressly made for the Dome of the Rock. It would consequently be unsafe to base any argument on their Byzantine character.

The wooden beam above the pillars is adorned with a wooden cornice, which is clamped on to the original square beam, and may, perhaps, be a later addition. In other respects it resembles those wooden beams found in so many early Saracenic buildings, and there does not appear to be any known example of a Byzantine building having such a wooden beam.

The arches of the arcade are semicircular; those under the dome have now the appearance of being struck from two centres, with a flat key-stone; but the structure of the original arch is hidden beneath a thin marble veneer, and the flat key-stone seems to point to a semicircular arch beneath. The original arches of the outer wall are also semicircular, though pointed arches have been built inside them. The structure was visible when the glazed tiles were removed in 1873, and it was then found that a small arcade runs on the top of the wall, with pillars of almost Norman outline. With regard to these arches, it need only be observed that they resemble those in the Dome of the Chain, and that they do not present that characteristic of Byzantine round arches previously mentioned, namely, the narrow key-stone and graduated voussoirs, with wide haunch stones.

The only other work in the Dome of the Rock belonging to an early date is the beautiful glass mosaic on the screen. It can hardly be doubted that the arabesque designs and Cufic inscription are of one date, judging from the colour and general appearance. That date, according to the inscription in 72 A.H., or 688 A.D. The designs on the mosaic are entirely conventional, resembling somewhat those in the Dome of the Aksah, which is dated 728 A.D., or forty years later. The absence of figures in the design is significant; for the old Christian mosaics in the Damascus mosque are almost entirely devoted to figure subjects, and the same is found to be the case in the Crusading glass mosaics at Bethlehem.

Such is a plain account of the principal details of the Kubbet es Sakhrah. There appears to be nothing in the building of distinctly Byzantine character beyond the pillars with their blocks above them, or at least, if there is, I have failed to gather from Mr. Fergusson's works what that detail is. The pillars appear to have been taken from an older building or buildings, and the habit of so collecting columns of very various design has been commonly adopted by the Arabs from a very early period. Such pilfered

columns are found not only at Jerusalem, but at Cairo, and at Acre, at Damascus, and at Gaza,—in fact, wherever old material was available. That this use of old material was a common practice of Byzantine architects seems on the other hand unlikely, and, at least in the case of Constantine's Basilica at Bethlehem, the pillar-shafts, bases, and capitals are of uniform character.

It is for architects to judge whether the above-mentioned facts are at all conclusive as to the claims of the building to Arab origin, and whether the preceding comparisons are sound in principle. If we would know what was the form and style of Constantine's Jerusalem Basilica, should we not study the Basilica he built at Bethlehem? If we wish to ascertain the date of the Byzantine architecture of the Golden Gate, it seems preferable to refer to Syrian rather than to European types. If we would arrive at a conclusion as to the date and style of the Dome of the Rock, it is at least only fair to inquire whether it has anything in common with the Dome of the Chain, which Arab historians state to have been the model from which it was designed.

Time does not allow any further account of the High Sanctuary and its buildings. The subject is almost inexhaustible, and when one has wandered day by day over the great area, descending into the damp rock tunnels, or entering into the purple gloom of the Chapel of the Rock, watching the countless doves which hover over the dome or crowd in the beautiful honeycombs of the great gateway roof, one's interest grows ever greater in the beautiful and wonderful enclosure. Much has been done to throw light on the origin of the various buildings,—so much that very unreasonable expectations have been raised and impossibilities have been demanded of explorers. Much still, no doubt, remains to be done, especially beneath the flagging of the platform, but it is to be remembered that the High Sanctuary is the second sacred enclosure of the Moslems, inferior only to the Kaabah, and that excavation within the area is regarded by them much in the same light in which we should regard proposed excavations in the choir of Westminster. It is only by patient study and by occasional opportunities that further information can be obtained, and that facts will gradually take the place of conflicting theories.

ARCHITECTURAL ASSOCIATION.

AT the ordinary fortnightly meeting of this Association on the 6th inst., Mr. H. L. Florence, president, in the chair, some conversation took place as to the balloting for members at the previous meeting, when, as reported in the *Builder* a fortnight ago (p. 1258, *ante*), nineteen out of sixty-two candidates were black-balled. Mr. Hayes announced that the committee had passed the following resolution:—"That a special business meeting be called, to consider the subject of the election of members, with special reference to the late ballot." He further announced that such special meeting would be held on Friday, the 13th inst. Mr. J. Douglass Mathews gave notice of his intention to move at that meeting the omission of the following words in Rule XI., "No one whose nomination has been voted upon and negatived shall be again voted upon in the same session." He considered that a great slur had been cast upon the gentlemen who had been rejected, and the sooner the rule was altered in the direction he had indicated the better. Mr. Ridge, with the same end in view, also gave notice of his intention to move to add the following words at the end of rule XI., viz., "without the sanction of the committee." The President incidentally remarked that to some of the candidates who had been rejected exclusion for a year from the benefits of the Association would be a very serious thing,—in fact, it would mean exclusion altogether, as they were in the last year of their articles, and would be out of London next year.

The following gentlemen were then elected members by show of hands, viz.:—Messrs. T. H. Letts, F. H. Jennings, C. Stuart Smith, M. Saunders, H. S. Saunders, W. Martin, — Blizard, — Goodwin, J. Jeffreys, Harvey Dyball, D. S. Henderson, A. Morton, J. E. Harpen, J. Coutts, and H. Fry. Nine nominations for membership were read.

A letter was read from Mrs. Cockerell, acknowledging a vote of condolence passed by the Association on the death of Mr. F. Pepys Cockerell. The letter contained the following passage:—"My only consolation in my great bereavement is the testimony given by all his friends to the memory of my beloved husband, and none are more delightful than those from the members of the profession he loved so well."

Mr. Somers Clark, jun., then read a paper on "The Organ and its Treatment," which we print on other pages.

In the discussion which followed,

Mr. H. H. Statham moved a vote of thanks to the author of the paper, and went on to say that although Mr. Clark had deprecated very strongly what he had called the "monster" organs in modern churches, in his (Mr. Statham's) experience adequately-large organs were but too rarely met with, and, in fact, the modern church-organ too often justified the derisive appellation of "a kist of whustles." It seemed o be the custom to provide churches with a sort of regulation pattern organ, which, as Mr. Clark had said, was generally somewhat about "16 ft. by 16 ft. by 20 ft." In fact, those of one firm which used to have large orders for churches seemed as though they were made in 300 ft. lengths, and cut off in portions as needed. In a church of any size there should be far more space allotted to the organ than was usually the practice. He was glad to hear Mr. Clark's direct onslaught on the conventional "organ-chamber." To box up an organ in the way so continually practised was the worst possible way of placing it. The reason why some of our old cathedral organs sounded so well was that they had plenty of space around and about them. The protection of the organ from changes of temperature was a most important matter, and he thought there should be no large windows opening on it, whatever might be the external effect. Another important point for consideration was the position of the organ, whether high or low. Mr. Best, the greatest organ-player living, had in one case within his knowledge advocated lowering the floor of an organ-chamber so as to get the instrument as low as possible. Then, as to materials and accessories of the building in which an organ was to be located, large quantities of curtains or draperies should be avoided, especially near the organ. As to the design of the organ-case, he quite sympathised with Mr. Clark in his dislike of what he called the "zinc-chimney-pot" style. He considered that the old English cases, which covered the tops of the pipes with designs in woodwork, were far more artistic. As to the influence of external design upon the internal construction of the organ, there was a great deal of misapprehension. In a design for an organ in a Gothic building the architect naturally wanted to get the highest pipes in the centre of the front, but such an arrangement was contrary to the principle of the construction of the instrument. The proper thing to do was to put the higher pipes at the sides and the lower ones in the centre, in the first place for æsthetic reasons, and in the second place on account of practical considerations. The pipes in an organ were not placed in order of sounding, but the largest pipe was placed at the extreme left of the sound-board, the next at the extreme right, and so on, the smallest of all coming in the centre. The reason for this was that if all the large (bass) pipes were put together at one end of the sound-board, they would swallow up all the wind from the smaller ones. The pipes being arranged thus internally, it was practically desirable that when pipes were mounted on the front as part of the design, they should be kept as near their normal position as possible, as the wind had to be taken to them by "conveyances" from the sound-board, and the longer these were the more liabilty there was to leakage, and the less promptly the pipes would speak. He had been interested in seeing Mr. Clark's sketch of the method of treating Italian organ-cases. It was a perfectly frank and legitimate mode of treatment, and had been followed by Professor Cockerell in his design for the great organ-case at St. George's Hall, Liverpool. A beautiful feature in many Continental organs was that the choir organ was placed a little in advance of the large organ, and as it had, in addition, the merit of convenience, it was surpising that it was not more often adopted. He did not think a gas-engine was sufficiently reliable for blowing-purposes, but it was always desirable to get some mechanical means of blowing if possible. It was also desirable to treat the blower as a being with a soul to be saved, and while he should be kept out of sight, he ought to be within hearing of the service. With regard to the position of the organist, there were many contrivances, more or less effective, for enabling him to sit at a distance from the organ. Perhaps one of the best of these was the pneumatic movement introduced by Messrs. Bishop & Son.* The organist was able to hear his instrument better when sitting a little away from it.

Mr. C. M. Hudson, in seconding the vote of thanks, said that as an amateur organist he fully agreed with the remarks made by the author of the paper and Mr. Statham as to the ill effects of confining the organ in a small chamber. Ample space above ought to be left, and in designing his organ-case the architect ought to look to the future, and leave space for the addition of further "stops" as funds were available.

Mr. Norbury spoke in favour of large organs, and as a matter of tone objected to organ-chambers. In his opinion the west end of a church or a transept had great advantages as positions for an organ. Hanging organs were also very effective. As to dimensions, instead of having an organ 16 ft. by 16 ft. by 20 ft., he would prefer to have it 20 ft. or 30 ft. by 8 ft. or 10 ft. only. By that means space would be available for spreading the pipes. As to seating the organist away from his instrument, it was advisable where practicable. At St. Michael's, Cornhill, the organist sat away from the organ, and there was an electric movement, which, however, sometimes failed.

Mr. W. F. Potter asked what form of roof was best adapted to go over the space containing an organ.

Mr. Riddett thought it would be an advantage, whenever possible, to have a small organ in the choir, and a larger one in a west gallery for grand occasions.

Mr. Francis Bramley Baker said that, speaking as a choirman, he had to complain that in most churches in which he had sung the architect had made the mistake of shutting the instrument up in a little box-like place,—treating it, in fact, very much like a man who held his hands over his mouth while speaking treated his voice,—did not give it fair play.

Mr. Spencer Nottingham thought that if a choir organ were provided for accompaniment, as suggested by Mr. Riddett, with a large organ at the west end for grand occasions, it would be a great step in the right direction. As a matter of convenience, the organ ought to be placed on the same side of the chancel as the choir vestry.

Mr. W. L. Spiers wished to know whether Mr. Somers Clark considered that an organ of two or three stops only would be preferable to an American organ for a village church for 100 or 200 people, and where it would be out of the question to spend 1,000*l.*, or anything like it, for an organ. He begged to support the vote of thanks to Mr. Clark, coupled with thanks to Mr. Norbury for lending the collection of drawings of organ-cases shown on the screen.

The motion having been carried,

Mr. Somers Clark, in replying to the points raised in the discussion, said he still thought that many of our church organs were too large for the buildings in which they were placed. As to the material, in churches, at any rate, architects would have to be content with ashlar walls, or brick or plaster, with perhaps a timber roof. Mr. Willis, when the Albert Hall organ was being built, expressed the opinion that the finest thing that could be done would be to complete the whole of the internal surface of that building with material that would reflect the sound, even to a plaster floor. That had been partially done at St. George's Hall, Liverpool, but not with unqualified success. The form of roof was a matter of no great moment, provided sufficient height was allowed. Mr. Riddett had suggested a choir organ and a large organ at the west end. That was certainly a splendid idea, but one not likely to be carried out except on rare occasions, on account of the cost. As to Mr. Spiers's question, an organ with only one or two stops would be a most doleful machine, emitting one perpetual grind, neither *piano* nor *forte*. Better introduce the village musicians into the church, with their euphoniums and violoncellos.

The London Labourers' Dwellings Society opened a block of new buildings in Burnett-street, Vauxhall ("Murray Buildings"), on Saturday last. We will give some particulars when we have had an opportunity to see the tenements.

* Described in the *Builder*, p. 800, *ante*.

NEW BUILDING BYE-LAWS FOR LONDON,

UNDER 41 & 42 VICT., CH. 32.*

Section 1,—"As to Foundations and Sites of Buildings," and section 2, "As to Walls," contain the most important new provisions, and should be subjected to a good deal of sifting, and to very keen scrutiny thereafter. These new bye-laws might seem to an outsider to indicate improvement in public opinion during the last twenty-three years, and a desire for a corresponding improvement in buildings. But such an outsider would be mistaken. The bye-laws are mere evidences of an endeavour on the part of public authorities to wrestle with the folly and wickedness of people who would, if left uncontrolled, build hopelessly unhealthy, damp, and unstable buildings,—endangering the health and safety of the long-suffering poor of London. The special importance of sections 1 and 2 of the bye-laws, to architects, builders, investors,—to everybody, in fact,—is due to their universal application. Some of the other sections may be brought into use pretty frequently; but every building or other erection hereafter erected will be regulated, more or less, by sections 1 and 2. If any of the provisions are in conflict with those of the Acts of Parliament, they will cause confusion; those which are in conflict with common sense will be worse than useless. If any are vague, they will be differently interpreted by district surveyors, and by other people; and litigation, ill-will, and annotated editions will be the results. Amendment, after a decorous interval, will then be inevitable, with consequent inconvenience to the public, and discredit to the Board, and to all members of the professions and trades especially affected, who should have shown foresight and energy at the right time.

If the bye-laws prove insufficient, and leave obvious evils uncontrolled, discredit will come swiftly on all concerned. The Board will be held responsible by millions of people; and rightly so, for the bye-laws will be practically what the Board chooses to make them. Surrounded by critics,—some hostile, and with keen eyes for defects,—others friendly, but not able to avoid seeing them,—some anxious to limit the Board's powers, others to reform its constitution,—it is clear that thorough performance in such a matter as this should be preferred. I cannot accuse myself of any want of painstaking in this endeavour to help the Board to make the bye-laws concise, unambiguous, and sufficient; and you have allowed me a very liberal share of space, so that details have been gone into, and the scope of the bye-laws made clear, by showing what the Acts would authorise, what the framers of bye-laws might have attempted, and what they have actually done.

Section 3 says that each district surveyor shall see that the provisions are observed; and section 4 awards a district surveyor a special fee of 10s., when he succeeds by means of legal proceedings in getting foul matter removed from a site. Section 5 enacts that plans and sections of public buildings are always to be shown to a district surveyor, and that he may see drawings of other buildings as well if he asks properly. Section 6 describes chimney-shafts and concrete buildings, which may be erected without special permission of the Board,—a provision which will do away with a large portion of the red-tape and delay that have vexed the souls of London manufacturers for a generation, and have put obstacles in the way of the use of concrete. Section 7 gives power to the Board to demolish buildings improperly constructed; and section 8 provides penalties for breaches, and gives a general power to the Board to do anything it likes,—to dispense in any case with the observance of the bye-laws, or to make conditions which shall be binding in place of them.

The order in which the different subjects are mentioned in section 16 of the 1878 Act has been followed in the bye-laws,—a lawyer's method, but an awkward one sometimes. There is a logical sequence which should be respected. Section 3, as it now stands, refers to the *foregoing* bye-laws, which can only mean sections 1 and 2. Clause 3 of section 16 very properly deals only with the subjects mentioned in clauses 1 and 2; but it would amount to the same thing if section 3 were transposed and made to follow what is now Bye-law No. 6,—a mere matter of form, it is true, but the present form looks very odd. The present No. 4 is allied in subject to No. 7, and might very well be incorporated with it, or, at any rate, be put after it. It contains a proper, though to all seeming not a very liberal, provision of pay for special services; but its prominent, disconnected position gives it a kind of satirical look which should be avoided. The order of the bye-laws would then be 1, 2, 5, 6, 3, 7, 4, 8, and in following them through they shall be taken in that order.

Section 5.—*As to the Deposit of Plans and Sections.*

Paragraph I.—"On notice being given to a district surveyor of the intended erection or re-erection, or alteration of, or of an addition to, a public building, it shall be the duty of the person giving such notice to deposit plans and sections of such building with the district surveyor for his inspection, and no work shall be proceeded with until seven clear days after such plans and sections shall have been so deposited."

Section 30 of the 1855 Act gives the district surveyor a good deal of control over the construction of public buildings. By the operation of this bye-law he will know, before anything is commenced, what are the main features of the work he is to be called upon to control. It is not stated that he shall retain the drawings, nor stipulated that he shall approve them. Magistrates will, however, be disposed to say that approval of everything is implied, unless by a proper letter the district surveyor puts something on record. Should not, therefore, such a letter be customary?—a letter which would approve "walls, roofs, floors, galleries, and staircases" (section 30), but reserve all minor questions. It might, in the long-run, save trouble to the district surveyor, as well as to every one else, if all matters of importance were definitively settled before work was started. Although the district surveyors cannot be compelled by law to do this, other architects would be better satisfied, if the present members of the District Surveyors' Association pledged themselves to set a good example. It might seem a corollary that the district surveyor should have for his own use complete copies of the drawings which he formally approves; but, however desirable this might be as an act of grace, there should be hesitation as to making it into a right. Public buildings in London are usually set about in a great hurry, and are frequently much altered in execution from the first proposals; in fact, many reasons could easily be given.

Paragraph II.—"On notice being given to the district surveyor of the intended erection or alteration of or addition to any house, building, or other erection, other than a public building, the district surveyor may, if he think fit so to do, by notice in writing, require the person giving such notice to produce a plan or plans and sections of any such house, building, or other erection, or of the intended alterations or additions thereto, for his inspection, and the erection of any such house, building, or other erection, or of any alteration or addition, shall not be proceeded with until the notice of the district surveyor for the production of the plan and sections of such house, building, or other erection or alterations or additions shall have been complied with."

In these cases also there is neither retention nor approval of the drawings,—only inspection of them; and the drawings are limited to plans and sections. No control over timbers or iron construction is given, either by the Acts or the bye-laws. Some day laws may enact that floors and roofs shall be strong enough to stand, but that time has not come yet. At present, and for some time to come, district surveyors must content themselves with friendly suasion when obviously insufficient work is put up; and lay wait for signs of failure, and consequent danger to life. Then a condemnation can be made. It is perhaps well thus to bear in mind how very little more power the 1878 Act is giving in these matters to the elbow of the Metropolitan Board and its officers. The public may be anxious to stretch the irreducible minimum a little farther before many years are past.

Section 6.—*As to the Deposit of Plans and Sections of Buildings to which section 56 of the Metropolitan Building Act, 1855, applies:*—

"On any person being desirous of erecting a furnace chimney-shaft, or of constructing a building of concrete, it shall be the duty of such person to deposit plans and sections of the furnace chimney-shaft or concrete building, as the case may be, with the district surveyor; and the district surveyor, on being satisfied that the furnace chimney-shaft or concrete building is to be constructed in conformity with the following rules, may permit the erection of such furnace chimney-shaft or concrete building; and the Board may, in every case where the district surveyor has declined or omits to grant such permission, permit the erection of such furnace chimney-shaft or concrete building."

a. This section does not deal with all buildings to which section 56 might apply. It only refers to two sorts of buildings, belonging to that rather numerous class. The heading might, therefore, be simply, "As to Furnace Chimney-shafts and Concrete Buildings."

b. The action of the district surveyor when permitting these erections will, as the law stands, be decidedly irregular. By section 56 an application is necessary, and by section 58 the approval is to be in writing, signed in a specified way; and none of this is superseded by anything in the 1878 Act. But this need not cause us any anxiety. The practical meaning of the bye-law will be, that the district surveyor will be empowered to permit the erection of a building, which the Metropolitan Board of Works would be certain to approve if applied to. A fee of 10s. has hitherto been paid in respect of these approvals "to such person as the Board may appoint" (under section 60). As "the expenses in and about such approval" will now fall on the district surveyor, how would it be to pay him the same amount for the same services?

c. The last portion of this paragraph sounds like a slap in the face to the district surveyors. It is quite unnecessary here, as the powers of section 56 will always remain, till Parliament takes them away. Besides, section 8 of these bye-laws gives most ample dispensatory powers.

d. It would be a good thing to bring the new "General Rules," which will be made under section 57, into one cover with the new bye-laws. It is well to do only what the Acts allow; but it would be the merest pedantry to sacrifice the convenience of the general public for what is practically no reason at all. The whole document would be called "Bye-laws, General Rules, and Regulations,"—a heading which might safely be left to define itself without references to Acts, sections, &c. After the Building Bye-laws would come the General Rules with respect to applications,—as to projections, general lines of buildings, &c., formation of new streets, naming streets and numbering houses, petroleum, &c.

The rules as to furnace chimney-shafts may now be given. The paragraphs have here been numbered, and transposed so as to come in the following order:—1, General; 2, Foundation; 3, Footings; 4, Width immediately above the footings; 5, Thicknesses of brickwork; 6, Batter; 7, Cornices and caps.

"*Furnace Chimney Shafts.*

1. Every chimney-shaft for the furnace of a steam *boiler*, or of a brewery, distillery, or manufactory, shall be carried up throughout in brickwork *or stonework laid in* mortar or cement of the best quality.

2. Every furnace chimney-shaft shall be built upon a bed of concrete satisfactory to the district surveyor.

3. The footings shall spread, where possible, on all sides of the base of the shaft, and shall have regular offsets. *The projection of the bottom of the footing from the face of the wall shall be equal to the thickness of the brickwork at the base of the chimney-shaft; that is, at that portion immediately above the footings.*

4. The width of a furnace chimney-shaft at the base, if square on plan, shall be at least one-tenth of the total height of the shaft, *reckoned from the top of the footings to the top of the cap;* if octagonal in plan, at least one-eleventh of the total height of the shaft; and if circular on plan, at least one-twelfth of the total height of the shaft.

5. The brickwork shall be at least 9 in. thick at the top of the shaft, and for 20 ft. below; and shall be increased at least one half-brick in thickness for every 20 ft. of additional height measured downwards.

6. Every furnace chimney-shaft shall have a batter of 2½ in. at least in every 10 ft. of height.

7. No cornice shall project more than the thickness of the brickwork at the top of the shaft. No iron cap to a shaft shall be less than 1 in. in thickness, and every iron cap shall be held down by iron bolts.

8. *There shall be paid to the district surveyor the following fees in respect of the approval and supervision of furnace chimney-shafts; for every furnace chimney-shaft not exceeding 75 ft. in height, 2l.; not exceeding 100 ft. in height, 2l. 10s.; for every 10 ft. in addition, up to 150 ft., 2s. 6d.; for every 10 ft. in addition, above 150 ft., 5s.*"

a. Minor alterations, that do not seem to require discussion, have been made in the wording; these are pointed to by the italics. Two paragraphs have been omitted,—one stipulates that no portion of the enclosures shall be of fire-brick, and the other that,—where projecting stones occur in a shaft,—the wall behind them shall not be in consequence reduced in thickness. These may be thrown overboard without a pang.

b. The thickness named for brickwork in 5 differs from the well-recognised rule of 9 in. for 25 ft. from the top, 14 in. for the next 25 ft., and so downwards. Superfluous weight, put on the foundations of these structures, is always an injury,—especially where nature provides only the poorest of foundations, or none at all. In some half-score shafts approved by the Board, and erected, and now looked over with a view to this point, this old rule seems to have been recognised by the designers and the Board. Why should there be a new rule calling for heavier walls?

c. The batter has been settled in 6 so as to absorb half a brick in 20 ft.; but it is very doubtful whether any batter should be prescribed. Why may not the internal dimension of a shaft be the same all the way up,—set-offs

* See pp. 1231, 1249, 1285, *ante*.

being formed externally? Some people prefer the insides of shafts in that way; and it is, besides, a somewhat convenient method of building when a shaft is laid against a wall, as so frequently happens in central London.

d. The paragraph as to fees is a new one. The suggested bye-laws set the example at the end of "Concrete Buildings." The fee is the present fee (appointed under section 50) + 10s.

"*Concrete Buildings.*

I. Concrete used for buildings shall be composed of Portland cement and clean Thames ballast, or of gravel, or crushed smith's clinkers, brick burrs, or small broken stones, or any hard and suitable substance; and each shall be passed through a screen or mesh not exceeding 2 in. diameter. Sand must be added to such materials *as directed by the district surveyor.* All such materials must be perfectly clean, and free from all greasy, loamy, or clayey matter; and, if necessary, to be washed.

II. These materials and cement shall be mixed in the proportion of not more than six parts of material as aforesaid, by measure, to one part, by measure, of the best Portland cement.

III. In making the concrete, a box, 2 ft. by 4 ft. by 2 ft., *or of other shape to contain the same quantity,* shall be used for the materials; and another box, capable of containing two bushels *shall be used for the cement.* The cement and materials must be turned over at least three times, and thoroughly mixed together with water.

IV. The concrete thus composed shall be laid into the walls of buildings all round, in equal layers, and grouted *with a mixture* of one cement to two of clean-washed sharp sand after each layer, until the walls are completed in height. The grout to be made as mortar first, and then thinned with water to the necessary consistence.

VI. The thicknesses of walls shall be equal at the least to the thicknesses for brickwork prescribed in the Building Act.

IX. The portions of the party-walls and chimney-stacks above the roofs of buildings must be rendered externally with Portland cement, *or otherwise protected.*

X. The rules of the Metropolitan Building Act, 1855, as to the use of timber in walls, and the other rules of that Act *which can be properly applied,* are to be observed *in concrete buildings.*

XI. There shall be paid to the district surveyor, in respect of his supervision of every concrete building, a fee one-half more in amount than the fee to which he would be entitled under the Building Act for new buildings or additions. No additional fee is, however, to be charged in respect of any alteration to a concrete building, *beyond the fee chargeable in accordance with the Building Act.*"

a. Italics point out minor alterations. Paragraphs 5, 7, and 8, of the bye-laws officially suggested may be omitted. 5 is a fragmentary relic of a larger clause, which has hitherto, in concrete permissions, stipulated for the concrete being "applied by one or other of the processes now in use." 7 stipulates for cores for flues and fireplaces. 8 could not be attended to in decent work, where door and window frames cannot be fixed till the walls are getting dry.

b. A description of the cement might be desirable; and the paragraph cut out from section 2 might come in here with this addition,—"The test, when ordered by the district surveyor, to be made at the works of the Metropolitan Board."

Sections 3, 7, 4, and 8, would deserve several paragraphs; but, in place of quoting the sections and making notes, I will express the hope that some one will make the necessary emendations in drift and wording. C.

SEWAGE TREATMENT AT HERTFORD.

ON Friday in last week a number of engineers, chemists, and sanitarians visited Hertford to inspect the sewage works there, which are now being conducted by the Rivers Purification Association (Limited), who undertake all the operations of defecating the sewage, under a lease from the Corporation, and for an annual subsidy. The Association, as was stated last year in our account of the Coventry Sewage Works,* which are also worked by the Association, has been formed for the purpose of carrying out the requirements of the Rivers Pollution Prevention Act (which prohibits undefecated sewage from being discharged into streams and rivers), by assisting town councils, local boards, sanitary authorities, and others, to purify the water-carried sewage and manufacturing refuse of their districts, by the system or combination of systems best suited to local conditions, and either to execute new works or adapt existing works for these purposes. The Association also undertakes to carry on the works and to purify the sewage. The basis of the Association's operations is precipitation by the aid of chemicals, the effluent water being passed over a comparatively small area of land where necessary or desirable. At Coventry nine acres of land in the shape of filter-beds are available as an auxiliary, but at Hertford chemical treatment alone is used. The system which the Association adopts consists in applying a cheap salt of alumina, in combination with cheap proto-sulphide of iron and milk of lime, the cost of the treatment varying according to the quality and flow of the sewage to be dealt with and the standard of purity required in the effluent water. At Hertford, where there is no land in use for filtering the effluent,—it being discharged direct from the works by a straight open cut about a mile long into the River Lea, at a point about half a mile above the town of Ware,—the chemical treatment is somewhat more costly than at Coventry, although the population of the latter city is 40,000,—nearly six times as great as that of Hertford,—and notwithstanding the fact that at Coventry the sewage is largely charged with manufacturing refuse from dye-works, &c. The population of Hertford is about 7,200. It is a thoroughly water-closeted town, and as there are no manufactories discharging into the sewers, the sewage may be considered as being of a purely domestic character. The daily flow, amounting in ordinary times to nearly a million gallons (or about 140 gallons per head) is large in proportion to the population of the town, as there is a considerable quantity of subsoil water leaking into the sewers.

The works, which were constructed in 1872 from the designs of Mr. Thomas W. Grindle (until lately borough engineer, but now manager of the works), were not specially designed for the identical means of treatment now carried on in them; still, they are fairly suitable for the process, although, as Mr. Grindle himself remarked, he should like the tanks 3 ft. or 4 ft. deeper (the present depth is uniformly 4 ft. 6 in., —a depth limited by the level of the subsoil water), especially at the ends where the sewage enters. The tanks are six in number, each 120 ft. long by 20 ft. wide, divided into sets of three, which are worked alternately. At the point where the sewage in its crude state first enters the works, a solution composed of sulphate of alumina and protosulphide of iron is caused to flow into it in a continuous stream, this solution being caused to mix well with the sewage by the latter being agitated by flowing through what is known as a salmon-ladder arrangement. A little further on a continuous stream of milk of lime is, in order to correct acidity, poured into the sewage, which then passes into the tanks for precipitation. Each tank has a weir at the lower end, over which the effluent flows into a filter 20 ft. by 20 ft., with about 6 in. of finely-broken coke at the bottom. The beds of coke are removed every day, and the coke being washed and aërated each time, is available for use over and over again. After passing through these filters, the effluent is utilised to turn an undershot water-wheel, which works the machinery for mixing the chemicals, and pumps the sludge out of the tanks on to an open space, where it is dried by exposure to the atmosphere. We were informed that the sludge is bought by the farmers at 5s. 6d. a ton, although not always so readily as could be desired. It should also be mentioned that partly owing to the shallowness of the tanks, the lowest foot of water in them, lying on top of the sludge, is considered too foul to pass into the filter-beds, and is pumped back to the crude sewage to be again treated with chemicals. Any excess of storm-water cannot be dealt with by the works, and it has to "go by the board,"—in other words, it is allowed to pass direct to the outfall. The cost of chemicals used at Hertford is stated to be 11s. 6d. per million gallons of sewage treated. The quantities used per day are: 6 cwt. of sulphate of alumina, 1¼ cwt. protosulphide of iron, and 1 cwt. of lime. The visitors were conducted over the works by Mr. Grindle, the manager, and by Messrs. Henry Robinson and J. C. Melliss, the engineers to the Association, together with Mr. Onslow, managing director, Capt. Twynam (director), and the Mayor of Hertford (Dr. Tasker Evans).

At the luncheon which followed the inspection of the works, Capt. Twynam, Mr. Onslow, and Mr. Robinson explained the objects of the Association, as carried on at Hertford and Coventry, Mr. Robinson deprecating the dogmatic preference for irrigation under all circumstances which he alleged to have prevailed in high quarters. Precipitationists, he remarked, had had an uphill battle to fight, but it was now becoming generally recognised that precipitation, efficiently carried out, was indispensable to the solution of the sewage problem in many localities. In conclusion, Mr. Robinson complimented Mr. Grindle upon the design of the works at Hertford, which were so well suited to the process now carried on there, although they were constructed when the chemical treatment of sewage had not been so far advanced towards perfection as was now the case. Professor Wanklyn made a few remarks, in the course of which he said that the effluent waters turned out by the Association, both at Coventry and Hertford, were excellent, considered as products which might be turned into rivers. He believed that precipitation processes were essential in many places to the solution of the sewage question, and the process which was carried out by the Association was the best one which had come under his notice. The Mayor of Hertford having expressed the satisfaction of the Corporation at the way in which the works have been conducted, the visitors returned to town.

* See vol. xxxv., page 1038.

A NATIONAL THEATRE NOT WHOLLY CONTROLLED BY THE PREVAILING TASTE.

THE proposition continues to find support in various quarters. In the current number of the *Theatre*, the paper read at Cheltenham is reprinted in a condensed form; it was also reprinted *in extenso* in an Irish contemporary; commended in *Touchstone*, and the practicability of the scheme questioned, without direct mention of the paper, in the *Observer* and the *World*. In the current number of *Social Notes*, in a paper on "A Reformed Stage," signed Leith Derwent, we find the following encouraging observations:—

"At the Social Congress recently held in Cheltenham, Mr. Godwin read a paper suggesting that the best reformer of the popular taste would be a theatre which the fluctuations of that taste should be powerless to influence. A home of the drama to which nothing impure or worthless should be admitted is, Mr. Godwin thinks, the luminary of which our theatrical darkness stands in want. This theatre, he decides, must depend for its existence 'upon that plan which gave us the great Exhibition of 1851 and some of its successors,—*a list of guarantors.*' State subsidies, the golden showers that cause the Comédie Française of Paris, the royal theatres of Berlin, Vienna, and other capitals, to flourish, are at present unobtainable in England. If some of our most eminent authorities on theatrical subjects may be trusted, they are also undesirable. The drama, if a brighter future awaits it, must trust for that future to men who,—indignant that what should be a means of education is turned to a means of debasement, — are sufficiently wealthy and public-spirited to devote time and money to the removal of a national reproach. Liberal and thoughtful management presupposed, a theatre conducted on these principles must in the end become a profitable property. It is by no means improbable that it would recoup expenses even from the commencement. 'Hamlet,' as Mr. Godwin justly reminds us, was played for upwards of a hundred nights at the Lyceum, to stalls, pit, gallery, &c., that, in place of the ruinous emptiness managers associate with the name of Shakspeare, presented a goodly array of playgoers. The 'School for Scandal' filled the Vaudeville during 400 nights. There seems little reason to suppose that the future would be denied a repetition of the successes of the past; above all, when those successes are looked for in a theatre established as a rallying-point of all who cherish a sincere attachment to dramatic art.

A stage given up to immodesty and buffoonery; playwrights who spend such talent as they possess in the production of dreary burlesques, or who, descending still lower, try how much immorality they can bring over from the French stage to the English, despite the licenser of plays; a scarcity of good actors, and a superabundance of actresses unfit to mouth melodrama in a barn,—such is the picture our theatrical world at present offers. Here and there we see a lady distinguished by genuine talent, and possessing some attachment to her profession, but tried by ceaseless temptations and struggling with a host of obstacles. All around her are the disreputable rivals who owe positions for which they are unfit to the patronage that brands with infamy both him that gives and her that takes. Art is the brightest, the tenderest, the fairest of mistresses. She is treated, so far as the drama is concerned, as a mere commodity of sale and purchase; and

blushes to see herself served by painted incapables who, destitute of talent and in general of education also, earn their employment as her handmaidens by the fact that they are themselves sold and bought. The scandal of a theatre directed by a *favorita* may be seen in Paris and elsewhere; but on the Continent the audience rigidly exacts that an actress shall be such in fact as well as in name. It is only in England that immorality and incompetency are alike accounted ornaments of the stage.

The task of such a theatre as that of which Mr. Godwin would have the present generation become the architect would be, in the most admirable sense of the words, 'to hold up the mirror to nature; to show virtue her own feature, and scorn her own image.' A good taste cannot be formed from bad models, and bad models are all that our plays at present furnish. When a school of actors worthy to interpret the dramatic masterpieces of our literature has been originated, the vicious imbecilities that at present excite the laughter of fools will speedily be banished from the London stage. The blindness of the public has never been such as to render it impossible to open their eyes to the loveliness of genuine art.

Must all the characters created by Shakspeare follow the example of the spirit-actors in the 'Tempest,' and melt into 'air, thin air'? Is the banished Coriolanus to find not only that his exile still continues, but that it is shared by Hamlet, Lear, Macbeth, Othello, and the other princes of the drama? The wit of Falstaff is silenced among us; the sweet names of Juliet, Viola, Ophelia, Rosalind are to the modern playgoer names and little more. Shall it be written that the chivalry of the existing generation was appealed to vainly on their behalf, and that Shakspeare, though the poet of all time, cannot be rendered the dramatist of ours?"

THE RESTORATION OF ANCIENT BUILDINGS.

On Monday evening, a public meeting was held in the Royal Institution, Colquitt-street, Liverpool, under the auspices of the Notes and Queries Society, for the free and impartial discussion of the principle and practice of modern architectural restoration.

Mr. T. H. Hall Caine (from the chair) said,—Forty years ago, or thereabouts, there arose in England and on the Continent a very general desire for the restoration of ancient buildings. The movement began with the clergy, who observed the slow but sure decay of their churches. It did not and could not stop there. Art-lovers everywhere, so far as they were represented by the architectural profession, took up the work with manifestations of hearty sympathy. The plea was mainly a moral one, and appealed but slightly to men's love of art. Buildings of inestimable beauty and historical value, in Venice and Vienna, in Paris and London, and throughout the English provinces, came out of the restorers' hands with whatever spick-and-span improvements the combined genius of priest and architect might devise for them. It was a holy work. It was a crusade of square, and trowel, and broadcloth, against sun, and rain, and time; and the elemental forces got the worst of it. Restoration, as a principle, was held up to admiration from many a pulpit, and the press echoed its praises. Well, the practice thus initiated continued to enlarge its sphere of action until very nearly every art-monument about which men would think it worth while to contend became embraced in its operations. Then suddenly, a year or two ago, the whole principle of restoration came to be challenged. In our piety we had forgotten our art. The whitewash of our immediate predecessors, which covered but did not destroy the art-treasures of the old craftsmen, was the light touch of a reverent element, compared with the merciless and dishonouring hacking of modern restoration. Religion, history, poetry, and art, were being sacrificed, perhaps to a vulgar utilitarianism, at best to an ignorant zeal.

Now, it is the object of these meetings to consider that plea and this protest. And first, let it be understood that this is no sectarian question. A Catholic friend, Mr. Frank Marshall, knowing my interest in the subject, writes:—"It makes a Catholic's heart bleed to see the chapels of our old English cathedrals so despoiled and desecrated. I should like to see our old churches restored to their proper use." There is much sad truth in what Mr. Marshall says. Large numbers of our ancient churches are structurally unfit for the Protestant form of worship. They were designed to answer the needs of what is called sacerdotalism; and the effort to accommodate them to the services of the reformed faith has robbed the aisles and the chapels of their first religious significance. Protestants should abandon them, and Catholics should be content to leave them as a witness of the past. Mr. Marshall would then be able to join hands with Canon Venables and the Bishop of Truro in an effort to preserve the best monuments of old English, religious, and artistic life. Even under existing conditions of things, the problem presented by this question of restoration rises superior to sectarian differences, and the vital matter both with Catholic and with Protestant is, and will be, How far is it worth the while of Englishmen to protect from dishonour and falsification the history of England as it is written in stone?

It is also necessary to say that this is not a professional question. I mean no disrespect to the architectural profession in saying it will be a sad time for national art-culture, and for the refinement of moral feeling which true art-culture involves, when the care of the grand old cathedrals, which make the face of our country fairer, ceases to be a thing of national importance.

And if this is not a professional question, so far as it bears upon broad issues, still less is it what is, in professional language, called a "Battle of the Styles." Efforts have been made to saddle upon Protectionists an undue regard for certain forms of art, certain styles of architecture. The principle of protection demands equally an earnest opposition to the ignorant destruction of Norman and Classic, Early English and Perpendicular, and the list of preservationists counts amongst its members men of such opposite shades of artistic opinion as Professor S. Colvin and Professor J. Ruskin.

And now a word relative to well-known restorations in the North of England. Few persons, I imagine, would recognise the sober lines of the eastern aspect of the Chester Cathedral of 1868 in the spic-and-span filigree of 1878. Dean Howson is just now engaged in describing in the *Art-Journal* the kind and extent of the cathedral restoration. In reading his papers I ask you to consider his grounds of defence of two pedantic reconstructions which have done more, perhaps, than all else to remove from the whole pile its ancient character. First, the pyramid roof at the choir end of the south aisle; and, secondly, the high-pitched roof of the lady-chapel, hipped down to the foot of the choir window.

Relative to the restorations at Ormskirk, I cannot trust myself to speak with patience. The one pitiful fact which usurps the whole domain of memory is, that thousands of bodies have there been tumbled out of their intermural burial-places at the will of an insensitive clergy and a sophisticated laity.

Just a word on the contemplated restoration at Grasmere. St. Oswald's Church was Wordsworth's parish church: his pew in it remains until now; but it is proposed forthwith to commit the peculiar sacrilege involved in obliterating the memories in Grasmere of the greatest of the lake poets. St. Oswald's has deep historical interest. It is bound up with the names of the elder and younger Coleridge, of De Quincey, Southey, and Scott. To disturb the shrine in which worshipped these giants in English thought will be a grim farce of vandalism and desolation such as no thinking man will be slow to whip with execration. A well-known parishioner writes to me:—"I trust you will be able to do something to stop our new rector in his wild attempt to destroy our historic old church. I can assure you that a very large majority of the parishioners are against him." So far as my poor powers go I will give what help I can; but the best help is self-help, and we shall hear no more of the Grasmere restoration if the parishioners in vestry do but give the scheme an emphatic opposition. Let that be done earnestly, and at once, or no power on earth will stop ignorant piety and pedantic vandalism in its work of ruin.

One word more, and it shall be on the prospect of legislative defence. There is, I fear, not much to be hoped for in these days from the predilections of the vulgar, who take the new for the beautiful.

Professor Ruskin, in acknowledging a little pamphlet of mine on the subject, says:—"I have, of course, the deepest interest in your work, and for that reason must keep wholly out of it. . . . . I am entirely hopeless of any good whatever from these modern powers and fashions. You who are able for it must fight with fools. I will be no more plagued by them." The language is emphatic, but no artist will call it unjust. Now, a resolution will be put to one of these meetings, asking for such an extension of the principle of the schedule of Sir John Lubbock's Bill as may embrace all old churches about which men would care to contend.

Papers by Mr. S. Huggins and the Rev. S. Fletcher Williams, to which we will return, were afterwards read.

Mr. J. M. Hay (ex-president of the Liverpool Architectural Society) moved the first resolution,—"That this meeting regrets the dishonouring and false treatment, under the name of restoration, of many ancient buildings in the North of England, and thinks the Society for the Protection of Ancient Buildings deserves the support of all those who are interested in art, archæology, and history." He said, it is of essential importance that our ancient monuments should be preserved. To bring back an old building to its original condition is simply an impossibility. As an architect, an artist, and an archæologist, I protest against the wholesale falsification of history as written in our ancient churches. The errors of greater artists may be discovered by lesser ones, and I should be the last man to construct a pyramid terminal to a cathedral aisle out of such slender evidence as the rake of a few buried stones might afford; or to substitute for a flat roof a high-pitched one supposed to be more in harmony with the spirit of the fabric.

The resolution was supported by Mr. J. S. Moore and Mr. Henry Clark (who regretted Mr. Caine's allusion to the non-sectarian nature of the question), and carried.

Mr. J. F. Drinkwater proposed the second resolution:—"That in view of their value as records of history and progress, the loss of which is definite and irreparable, ancient buildings demand the utmost care of individuals, and are worthy of the legislative protection of the public." This was seconded by Mr. George Rose, and supported by Mr. R. R. Douglas and Rev. S. Fletcher Williams, and carried unanimously.

A NEW GUARD-HOUSE AT THE TOWER.

At the south-east corner of the Tower, overlooking the Thames, a new guard-house for the use and shelter of the soldiers when on duty, has just been erected by the Government authorities, there being little or no protection against wet and the inclemency of the weather at an adjoining fragile old shed, which, until lately, did duty for that purpose. It is built of Kentish rag, with Portland stone dressings, and open port-holes in front. It is about 50 ft. in length, and surmounted all round by a castellated parapet, between 2 ft. and 3 ft. in height, inclosing a flat roof. Extending the whole length of the building on the south side, in front of the river, is an arcade upwards of 6 ft. in width, having Gothic arches in front, faced with Portland stone, the arcade serving as a covered promenade for the military on duty. The building contains on the ground-floor a spacious apartment for the use of the men when not actually on duty. The building has been erected by Messrs. Martin & Wells, Government contractors, of Aldershott. The site upon which the former guard-house or shed stood has been cleared and ornamentally planted.

MANCHESTER CITY SURVEYOR.

The son of the city surveyor, Manchester, Mr. J. G. Lynde, is a rising engineer resident there, and being engaged in some important public works in which the Corporation are interested, Mr. J. G. Lynde has thought himself bound in honour to resign his appointment, holding which he would have to advise the Corporation. At a meeting of the City Council on the 4th inst., the Mayor moved:—

"That this Council, whilst accepting the resignation of their city surveyor, Mr. James Gascoigne Lynde, with regret, recognise and appreciate the honourable motives which have induced him to take the step, and avail themselves of the occasion to record their sense of the ability, integrity, and zeal with which he has served the Corporation for a period of twenty-one years, and their best wishes for his future prosperity."

Alderman Lamb seconded the motion, which was unanimously carried, and a special committee was appointed to take steps to obtain a gentleman to succeed him in the office.

"ABOUT ETCHING."

SIR,—I always read with interest and instruction whatever in the way of art criticism the *Builder* puts forth, and I thank you heartily for the appreciative article of Saturday. The writer, however, is wrong as to the causes which first set me, I will not say to draw, but to etch. Draw I always did from boyhood, but drawing with the *point* was *first* suggested to me while demonstrating surgical anatomy to the students in the great military hospital at Grenoble, where I was what is called "prosecteur." Some one present noticed the "length of handle" which I gave to the knife, and I said it was from the habit of freehand-drawing, and that if they, the students, wanted to operate well, and see what was going on at the end of their instrument, they had better cultivate the use of the point.

And, in fact, I made them all draw instead of describe the parts they had been dissecting, and with the best results as to surgical teaching.

Then, as a matter of fact, I never did neglect my practice for my drawing, even for a moment. I have been a most energetic and constant worker in it for thirty-five years, and it is only in the autumnal holiday that I have ever permitted myself to sit down to etch. I am quite aware that in our profession, as in every other, there is a stupid class, who see in every occupation outside the professional groove a proof that you are neglecting your work. I have a contempt for these gentlemen of one idea, and never condescend to disturb their belief, or their pretended beliefs. Meantime, if they had a grain of foresight they would perceive that the greater the cultivation the more advanced would be the social status of the physician and surgeon, and that it is because we have not now the Meads and the Sloanes, who were the leaders of society in their day, that we have deservedly lost caste.

My father, who was editing the *Medical Intelligencer*, and carrying on a large practice at the same time, was told by an eminent physician of his day (Dr. Clarke) that if he played the violoncello (which he occasionally did in the evening), he would lose his practice; and I have been told over and over again that if I published what I drew it would be the same thing. I need not say that, like my father before me, I have always held this sort of *professionalism* at its proper value, and treated it accordingly.

However, after thirty-five years of hard work the day will come, I suppose, when I shall have none to do, and then, if eyesight endures, I count on doing some *real* art work, and not only that, but on saying openly what I think has to be said on the subject. F. SEYMOUR HADEN.

COSTLESS POWER FOR THE ELECTRIC LIGHT.

SIR,—In the *Builder* for Nov. 23, some space was given to portions of a report upon the electric light addressed to the Loughborough Corporation by a firm of architects in that town. Some of the statements set forth appeared to me to be based upon views of science so novel and uncommon among engineers, that in the last number I looked for some comment upon them, or a little information sought. Somewhat to my disappointment, being interested in the use and application of water and water-power, no reference to the report appeared, and I therefore feel constrained to seek the desired information myself, and, by your leave, in the same medium, premising that I am in no way concerned in gas, but, on the contrary, shall be glad to see the electric light brought to a point of economy and efficiency of which at present we have no experience.

First, then, Messrs. Hodson's report states that the principal source of cost after the provision of the apparatus is the motive power needed to generate electricity; that in the case of Loughborough, *like the majority of towns having a supply of water by gravitation*, there exists during at least six months in the year, an ample supply of water sufficient for this purpose, which supply, owing to the *incapacity of reservoir space, is absolutely wasted.* Now, for my present purpose, it is not necessary that I should stop to ask how it comes that the majority of towns having a gravitation supply are here placed in the same category as Loughborough with respect to catch ground area and reservoir capacity, but will pass on a few lines, and ask Messrs. Hodson in what manner "every facility exists" for converting the waste water into useful light? It is expressly stated that the reservoir cannot contain this water, and yet, so far as the report in the *Builder* is concerned, not a word is said as to the means of storing it, so that it shall become,—what is indispensable,—a constant and equal motive power.

Will the authors say at how much they have estimated the cost of this means? At how much the cost of a new reservoir for, say 180 days' consumption, with its preliminary expenses of an Act of Parliament, probably opposed,—and compensation for land taken, and for water withdrawn,—say one-third of the total volume, for line of pipes of sufficient capacity, valves, gauges, air-cocks, and discharge drains, and finally, for the hydraulic motor? How many instances can they cite in which a gravitation supply for town's purposes has cost less than 3d. per 1,000 gallons, and how many that have exceeded 6d. per 1,000? Perhaps it may be replied that the whole is merely a suggestion, thrown out for consideration; but, if so, why say that "every facility exists" for converting the waste power into light?

In this sense, equally does every facility exist for converting the winds that blow at the equinox, or the rain as it falls from heaven, into useful power. There, too, waste power exists: why not use it? Because it will not pay. Because experience tells us that under these conditions, water power has, and can have, no chance of competing against steam power, under the ordinary conditions of cheap coal and iron. Taking the average cost of the pure water supplied to towns, recommended for use, to be 4½d. per 1,000 gallons, and adopting the figures of the report without examination, we find that the cost of the water alone, for the 70 cubic feet per minute, giving out at a pressure not stated eight indicated horse-power for an average daily period of say ten hours, would be as follows:—

$$\frac{70 \times 6{\cdot}25 \times 60 \times 10 \times 4\frac{1}{2}}{1{,}000 \times 12 \times 20} = 4l.\ 18s.\ 6d., \text{ or}$$

nearly 1,800*l.* per annum for a matter of 400 lamps, and this exclusive of all motors, electric apparatus, carbon, and supervision; a result somewhat different from the 20*l.* set forth in the report. This will scarcely afford much encouragement to the Loughborough corporation, nor to other public bodies struggling for a little *dry* light upon the light question.

One other point demands brief notice, and my queries are ended. How do Messrs. Hodson propose to utilise the waste powers of the rivers of this country? At every mill on the Soar they say sufficient power is wasted to light up in a *glorious* manner every village along its banks. I do not know much of this river, nor of its mill and other riparian owners; but here, in Yorkshire, any attempt to raise the levels of existing weirs, so as to create storage for a constant flow of water for any purpose whatsoever, would be opposed at every step, and would be hopeless. Indeed, it is thought by many of our most experienced engineers, in view of the disastrous and increasing effect of floods, that all river obstructions for purposes of water-power only should be done away with. Instead of a "glorious" electric light, I fear the motive-power of these streams would become the source of a glorious Parliamentary fight.

But, as I merely ask for information, and may have overlooked some mysterious creation of constant power, I pause for a reply.

M. PATERSON.

A NEW TOWN-HALL AT HOVE.

TOWN improvements of a varied character are about to be effected at Hove, near Brighton, which is rapidly increasing both in population and importance. The Town Commissioners have decided upon the erection of a new Town-hall upon an eligible site which has been secured in Church-street. The building, which will cost 25,000*l.*, is intended to be a spacious and ornamental structure. The Commissioners are likewise about to provide a new cemetery, for a population estimated at 50,000, including the erection of mortuary chapels and other necessary buildings, the cost of which is estimated at about 15,000*l.*

Royal Scottish Academy.—At a meeting of the Royal Scottish Academy, held on the 4th inst., Mr. Arthur Mitchell, M.D., LL.D., was elected Professor of Ancient History to the Academy, in room of the late David Laing.

BLACKBALLING AT THE ARCHITECTURAL ASSOCIATION.

SIR,—I have read with combined indignation and amusement your report of the proceedings and "speech" of the Mr. W. Scott who, it appears, is the author of the farce lately played at the Architectural Association,—a farce which was practically an insult flung in the face of at least thirty-eight members and their friends. Will you allow me to analyse the figures? Nineteen candidates out of 63, or just 30 per cent., were blackballed by thirty voters. The rules of the Association provide that one black ball to four white balls is fatal to a candidate. Each candidate was obliged to be proposed and seconded by two members. Thus Mr. W. Scott and four friends had it in their power to reject the nominations of thirty-eight fellow-members, and in the recognised absence of any valid reason for objecting to most, if not all, of the names proposed, and in the absence of any figures to the contrary, it is fair to assume that the blackballers did actually thus insult a body of men who are believed to be gentlemen. The fact that only thirty voted out of 130 present is a proof that better feelings prevail among the mass of members.

I am not, and am not likely to become, a member of the Architectural Association; but, like a large portion of the general public, I take great interest in its work and in the work of the profession at large; and I do know that it was never intended to be the club of a clique. The public will, I think, wish the Association to declare in a decided manner whether architectural students of unblemished character are to be denied admission to its advantages through mere caprice. It will remain either for these blackballers to maintain the Architectural Association as the sacred abode of shining lights like themselves,—and for others not so gifted, but still recognised as ornaments to the profession, to form for poor despised students a separate body to carry out the intentions of the original founders of the Association; or for the Association, *en masse*, to repudiate this interference.

AN OBSERVER.

STRENGTH OF STONE.

SIR,—Will any of your readers tell me where I can obtain information as to the transverse strength of stone? Tables of crushing strength are given in all the various works on building materials; but I can find nothing about the transverse, with the exception of "Barlow's Strength of Materials," in which is given a short account of some experiments made by Rennie on Green Moor (Yorkshire) paving stone, from the results of which Barlow deduces, using the same formula as for wooden beams, viz., $S = \frac{2\,W}{4\,b\,d^2}$, a breaking weight in centre of from 335 lb. to 339 lb. per square inch of section. Cases frequently occur in practice when it is desirable to know what weight can be safely supported by the stone-head of a doorway or window, and I therefore wish to ascertain if any reliable experiments have been made as to the strength of the various kinds of stone used in this manner. W. A.

CONCRETE ROOFS.

SIR,—I live in a house built of concrete, having a flat roof of the same material, and occasionally the ceilings and walls on the top floor are streaming with water. The house has been built several years, and at first I thought the rain found its way through the roof, and I had the outer surface covered with asphalte. I have now arrived at the conclusion that the damp is caused by the moisture of the atmosphere condensing on the cold ceilings, and that the rain has nothing whatever to do with it. Can any of your readers suggest a remedy for the evil? J. M.

*** A coat of absorbent plaster. But proper ventilation would lessen the necessity.

Valuation Lists of the Metropolis.—A circular from the Metropolitan Asylums Board shows that the totals of the valuation lists of the metropolis were:—Gross values.—Metropolis, 25,816,267*l.*; the City, 3,843,513*l.*; and the Middle Temple, 13,144*l.*; making a total of 29,672,924*l.* Rateable values.—Metropolis, 21,209,749*l.*; City, 3,222,393*l.*; and Temple, 10,929*l.*; or in all, 24,443,072*l.* Last year the respective totals were:—Gross value, 29,022,138*l.*; and rateable value, 23,903,833*l.*

A YARD OF BALLAST.

Sir,—Following your correspondent, "A Contractor," as to what a cubic yard of lime is, I should like to know what is a cubic yard of, say, Thames ballast?

Our contractor tells me that a yard is a "one-horse" load, and that a "two-horse" is two yards, the check is the size of the carts; but I fail to see any proof at all that the "one" or "two" horse loads must be the measurement given, for the carts are very variously loaded and afterwards shaken down in transit.

Now I happen to have a dispute of this kind. A floor containing exactly 33½ cubic yards, including the bulk of some 80 light iron joists, has taken 47 yards of these "one" and "two" horse loads of ballast, besides the bulk of 72 sacks of cement, nearly another 2 yards. I say it is impossible; but the contractor replies, "You do not allow for *shrinkage* in mixing." So the whole matter turns on what is lost in bulk by the addition of water.

I have had twenty years of practical experience, but have never found Thames ballast or any other ballast to lose nearly one-half in mixing, and I should like to know very much what light some of your readers can throw upon this much-vexed question. An Engineer.

TOWN CLERKS AND BOROUGH SURVEYORS.

Sir,—Will you kindly allow the following question to be ventilated in your columns?

When a Corporation or Local Board have decided that a certain street in their district shall be made, whose duty is it to get the names of the owners, so that the proper notices may be served upon them to make the street? In many instances, this, like other work in my opinion belonging to the town clerk, is shelved on to the borough surveyor.

It is the duty of the town clerk, or clerk of the local board, as the case may be, to serve the notices; it is, therefore, his duty to see that they are served on the proper persons, and this is borne out by precedent, for in the preparation of Parliamentary plans, &c., the lawyers tell us that it is their duty to obtain the names of the owners, or reputed owners, &c., and serve the notices, the engineers and surveyors being thus confined to their proper business.

I think it should be understood that after the plans for making a proposed street have been prepared by the borough surveyor, a tracing of the plan of the street, with each property numbered thereon, should be handed to the town clerk, who should then obtain the names of the owners and enter them in a book of reference, from which he should serve the notices.

This is an important matter to a surveyor, because when he is called upon to do this part of the town clerk's work, he takes practically all the responsibility off the latter, who, as a rule, is generally well paid for his services, compared with the borough surveyor, who has quite sufficient to do to spend the money of the ratepayers to the best advantage. Delta.

WORK DONE DURING BANKRUPTCY.

JAMESON AND CO. *v.* THE BRICK AND STONE COMPANY, LIMITED.

This case, in the Court of Appeal, before Lords Justices Bramwell, Brett, and Cotton, gave rise to a question of law of some importance as to the power of an undischarged bankrupt to hold and deal with property on his own account.

The plaintiff, who was an architect and surveyor, became bankrupt in 1873, and the bankruptcy proceedings were not brought to a close till the 22nd of January, 1878. In the meantime, the plaintiff carried on business as an architect and surveyor, and during the year 1877 did some work in preparing plans and making valuations for the defendants. On the 16th of January, 1878, the plaintiff commenced this action to recover the value of the work done from the defendants. One of the defences relied upon by the defendants was that in consequence of the bankruptcy of the plaintiff all property acquired by and debts becoming due to him during the continuance of the bankruptcy proceedings were vested in the trustee, and, therefore, the trustee was the only person who could recover the value of the work. It was proved at the trial that the plaintiff employed six clerks to assist him in his business; but a considerable part of the work in question was done by the plaintiff in person. The trustee had not claimed the sum due from the defendants. Lord Justice Baggallay, who tried the case, on the facts stated above, gave judgment for the plaintiff. The defendants appealed.

Mr. Digby Seymour, Q.C., and Mr. Gainsford Bruce, for the appellants, contended that an undischarged bankrupt could not hold property or sue for a debt on his own account, except in the case of property or money acquired by his own personal skill or labour alone. They admitted that there were decisions on the old Bankruptcy Acts against their contention, but they argued that the Bankruptcy Act of 1869 had altered the law so that those decisions were no longer applicable.

Mr. Cave, Q.C., on behalf of the plaintiff, contended that there was no distinction in construction between the present Bankruptcy Act and the earlier Acts, and therefore the decisions on the earlier Acts were still in force; and those decisions showed that the law was that, although as against his trustee an undischarged bankrupt could not assert his title to a sum of money earned otherwise than by his own personal labour or skill, as against other persons he had a good title until the debt was claimed by the trustee.

Their lordships dismissed the appeal, being of opinion that the effect of the decisions was unaltered by the present Bankruptcy Act.

PREVENTION OF WATER-WASTE.

Mr. George Jennings has patented an invention made by his son which bids fair to supersede the expensive and objectionable water-waste preventer, with its attendant cistern now in use. It consists in a simple attachment to the handle or pull of any description of basin without in any way altering the character of the w.c. with which it may be connected. If the closet-handle is raised and lowered in the usual and proper way, without unnecessary delay, the attachment for preventing waste being unnecessary is not brought into action, but any attempt to waste water by retaining or propping up the handle is defeated, as the latter, after an allotted time, becomes mechanically detached, allowing the discharge and service valves to close, irrespective of the position of the handle, which must be again lowered or dropped to reopen these valves. The difference in time between the instantaneous closing of the discharge-valve and the gradual closing of the service-valve insures that after-supply so necessary to all closets. It is very simple and ingenious, and can scarcely fail to come into use.

SOUTHPORT.

The New Victoria Foot-Bridge was opened on the 3rd inst. It has been erected for the Corporation by Messrs. Shewell & Co., of Darlington, and connects Virginia-street with London-street. It is 456 ft. long, in four spans, the longest girder being 134 ft. The bridge is 10 ft. wide from centre to centre of girders. The cost has been upwards of 3,000*l.*

The Smedley Hydropathic Institution has just received an addition in the shape of a new wing (capable of accommodating eighty persons), which has been erected from the designs of Messrs. Royle & Bennett, architects, Manchester, by Mr. Southern, builder, of Salford, and Messrs. Wishart & Irving, builders, Southport.

COMPENSATION CASE.

THE SOUTH-WESTERN RAILWAY COMPANY AND THE WIMBLEDON LOCAL BOARD.

SEWAGE FARM.

A two days' inquiry has been held, before the Under-Sheriff of Surrey and a special jury, to assess the amount to be paid to the Wimbledon Local Board for 0a. 3r. 35p. of land, part of the sewage farm adjoining the Merton-lane level-crossing, the company having acquired Parliamentary powers to construct a bridge over the main line of their railway at that spot.

Evidence was given on the part of the claimants by Mr. Driver, Mr. Galsworthy, Mr. Ogden, Mr. Mason, and Mr. Grantham, C.E., whose valuations for land and construction of sewage carriers, &c., ranged from 1,478*l.* to 1,648*l.*

The valuers on behalf of the company were Mr. V. Buckland, Mr. Harry Jones, Mr. Robert Vigers, Mr. Rowell, C.E., and Mr. Jacomb, C.E., whose estimates amounted to 604*l.*

The jury awarded 800*l.*

It was understood that this amount being below the offer made by the company, the Local Board will have to pay their own costs, and half the costs of the jury.

ACCIDENTS.

A concrete house has fallen at Quarry Hill, Hamilton, N.B. A petition having been presented to the Dean of Guild Court, praying that a competent person should be appointed to inspect the building, and ascertain the cause of the catastrophe. Messrs. George Bell (of the firm of Clarke & Bell, architects, Glasgow) and White (Assistant Master of Works, Glasgow) were appointed in terms of the prayer of the petition, and they have reported that, in their opinion, the fall of the building was to be attributed to the faulty principle in construction, the lightness of the walls against pressure, the want of proper bond, and careless workmanship in the erection.

Shortly before noon on Saturday last the side wall of the Bell beerhouse, in Church-street, Lambeth, fell down, without any warning, on to the roof of a cottage, 3, Norfolk-place, a narrow court out of Church-street, immediately opposite the church. The cottage was occupied by William Brown, a mason's labourer, and his wife and five children. Mrs. Brown and the three younger children were buried in the ruins. On being extricated, one child was found to be much injured, one was breathing, and died before it reached the hospital, while the mother and a child of eighteen months old were picked up dead. The inquest was opened on Wednesday. One witness deposed to having noticed for the previous fortnight that the wall (which was about 40 ft. high) was out of the perpendicular, and that it was not shored up. The inquiry was adjourned.

VARIORUM.

Under the title, "How Can a Sound Knowledge of Music be best and most generally disseminated," Dr. John Hullah has published, through Messrs. Longmans, the paper read by him at the Cheltenham Congress of the Social Science Association. The two points which the writer endeavours to establish are,—1st, the necessity, if we are to make music a universal accomplishment, of beginning the teaching of it very early; and 2nd, of ascertaining through competent inspection, that it is, at least in schools aided by public grants, properly taught. The paper is well calculated to advance the object in view.——From *Great Industries of Great Britain* for December we get the following as to the capital of the hardware district:—"If Birmingham is not now in a special manner the seat of the iron and steel industries of Great Britain, Birmingham and its district may truly be called their cradle. Situated in the very centre of the kingdom, cut off from those fishing and trading pursuits which populated the coast, forced upon its own resources for support, and possessed of extremely valuable mineral in the form of coal and iron, it was inevitable that this district should become the home of the descendants of Tubal-Cain. There is no doubt that Birmingham was originally one of a group of scattered villages which sprang up about the great South Staffordshire coal-field, and sheltered the primitive artificers who wrought up the Staffordshire iron into rude forms of use and beauty. These villages have now become large and populous towns, and Birmingham, the greatest of them all, is bidding hard for the honour of being the second city in the empire. Still, in relation to the iron and steel industries, it can have no isolated importance, and cannot be separated from the family group. So close is the connexion between it and the neighbouring hardware towns, that they really form one industrial community. Smethwick adjoins it with scarcely a break; and from Smethwick extend in one continuous chain Oldbury, West Bromwich, Wednesbury, Darlaston, Bilston, Dudley, and all the towns of the Black Country. From the forges of this grim locality come the immense supplies of bar-iron, rod-iron, angle-iron, and sheet-iron which are worked up in the Birmingham factories. From here the Birmingham tool-makers, die-sinkers, and pen-workers get their trusty steel in convenient forms made ready to their hands. Gun-locks from Wolverhampton, Darlaston, and Wednesbury are fitted into Birmingham guns; buckles, harness, and stirrups, from Walsall, are worked up into Birmingham saddlery and harness. Willenhall padlocks, Wolverhampton coal-scuttles, Walsall curry-combs, Dudley fire-irons, West Bromwich hollow-ware, and a thousand other hardware products from these and a score of other tributaries, flow daily into the warehouses of the Birmingham merchants and factors, thence to be distributed to every part of the habitable globe. Industrially and commercially, Birmingham cannot be regarded otherwise than as the centre of a system—the capital of the Midland hardware district."——*Mirth*, for its Christmas number, consists of one story, "The Finding of the Ice Queen," by Frank Barrett,—original and amusing.——In like manner, *Tinsley's Magazine* gives as a Christmas number one exciting story, by B. L. Farjeon, called "The Mystery of Roaring Meg."——The *Victoria Magazine* Christmas number, besides a number of tales, includes a photograph of its editor, Miss Faithfull, and a portion of a serial, by Emilia Aylmer Blake (Mrs. Gowing), entitled "My Only Love."——A new edition for 1879 of "Sprague's Pocket Diary and Architects' and Surveyors' Memorandum Book" has been issued, containing their well-known tables, &c., which have been extensively used for the last ten years by surveyors. The present edition has undergone revision, and much valuable matter has been added, under the editorship of Mr. E. Wyndham Tarn.

Miscellanea.

The Building Trade.—A meeting of the Lincoln Master Builders' Association (a branch of the National Builders' Association of Great Britain) was held during the week, to take into consideration the question of a reduction in the wages of workmen in the various branches, and an increase in the hours of labour. After a discussion, it was unanimously resolved that notice to this effect should at once be sent to the representatives of each branch—carpenters and joiners, masons and bricklayers; such notice to expire according to the agreement made between the operatives and employers some time since. By this arrangement the alteration, so far as regards the masons, will take place at the end of three months from the time the notice was given; the carpenters, joiners, and bricklayers six months. In taking this step the Lincoln master builders are only following the example of other employers in large towns, and it is satisfactory to note that in many instances the men have promptly met their employers in the matter, well knowing that under the present general depression in trade some concession must be made to induce building operations. The Lincoln master builders have for some time been labouring under a great disadvantage. Paying a higher rate than firms in surrounding towns, their inability on this account to compete with contractors from those places has led to important works being placed in other hands, thus creating a greater local depression than would otherwise exist. This being the case, and as it is not for a moment to be supposed a Lincoln man would work for a stranger at less wage than he would for an established Lincoln builder, the right course would apparently be to promptly arrange a meeting between employers and employed, and boldly face the difficulty before the new year.

Smithfield Club Cattle Show. — The show will close this Friday, December 13th. The machinery and implement departments constitute a most interesting exhibition of themselves; and so great is the continued increased demand for space that it is in contemplation on the part of the Agricultural Hall directory as to whether they may not be compelled to enlarge the premises by the introduction of an annexe on the north side of St. Mary's Hall, utilising for the purpose an outbuilding and a small piece of land they still possess unoccupied in that direction. The galleries are replete with novelties in agricultural implements. The St. Pancras Ironwork Company is the only firm who show any fittings for cow-houses, and they exhibit several different designs of their improved sanitary iron fittings for cattle-stalls and piggeries. These are designed after the recommendations of scientific and practical men, and while dispensing with any complicated arrangements, are strong and safe for the beasts, and calculated to prevent waste of food and any spread of contagion. Their system of water-supply and general arrangements for cleanliness are well thought out. Their patent piggery fittings are also strong, simple, and efficient. Their exhibits at the Paris Exhibition obtained a silver medal.

"Art in Landscapes."—This was the title of a paper read by Mr. William Neilson on the 4th inst. before the Edinburgh Photographic Society. The author laid down two propositions,—first, that art was not an imitation of Nature; and second, that pictorial grandeur depended wholly on shades. Shades, he said, were the great essentials in a picture, while, of course, there must be dominant and other lights; but these could not be wrong if the shades were right, seeing that they existed as cause and effect. The photograph did not represent nature. In nature they saw nothing sharp, while in the photograph they saw the sharp edges of a razor, and nature did not like razors. What he advised the photographer who wished to make a picture to do was, after having got as strong a foreground as possible, to study his view in a salient light, and find what arrangement of shades would most bring out its main features, and let non-essentials look after themselves.

Signs of the Times.—A sale of timber and woodwork at the Millwall Docks, on the 11th inst., included some thousands of bundles of "hand-made plasterers' laths," and about a thousand 1¼ in. and 1½ in. deal doors, all from Gothenburg, ready to hang.

Sale of Building Stances in Edinburgh. On the 2nd inst. several building stances, belonging to the Corporation of Edinburgh, were disposed of by public roup. The first lot, consisting of an area in Royal-crescent (between Nos. 10 and 14), containing stances for three houses, and measuring 78 ft. in front, was sold at the upset annual feu-duty of 22*l.* 10s. to Mr. Alexander Robertson, builder, Summerbank. Lot No. 2, fronting the public road from Broughton to Canonmills, measuring 170 ft. in front along the road, with an average depth of 115 ft. from front to back; having also a frontage of 54 ft. towards a street proposed to be formed from the public road to Scotland-street, was acquired by Mr. Robert Paterson, jun., on behalf of the Edinburgh School Board, for the upset annual feu-duty of 9s. per foot of frontage to the public road, and 6s. per foot of frontage to the proposed new street. Lot 3, immediately to the south of part of the first-mentioned area, being the corner formed by the public road and the proposed new street, of an average width of 55 ft. towards the public road, and an average depth of about 95 ft. from front to back, was purchased at the upset annual feu-duty of 24*l.* 15s., by Mr. J. B. Wemyss, architect, Leith, on behalf of the German congregation in Edinburgh, who propose to build a church on the site.

Doctors and Architects.—At a meeting of the members of the Gloucestershire branch of the British Medical Association, Mr. F. W. Waller read a paper showing how the medical and architectural professions could work together for the public good. He pointed to the important aid the medical profession could render the architect in designing and constructing public institutions and private dwellings, more particularly those of the middle and lower classes, in devising the best means of providing good sanitary arrangements. If the two professions could be got to co-operate for this end, the architect would be able to make health conditions an essential of his plans. Among the means suggested by Mr. Waller for carrying out the co-operation suggested were the interchange of professional books and periodicals, and the arrangement of meetings between the two professions.

Liverpool Master Builders' Association. The twelfth annual report of the Liverpool Master Builders' Association has been published, together with a report of the dinner held at the Adelphi Hotel, Liverpool, in November. The report says:—During the year a National Association (a combination of local associations) has been formed, for the purpose of assisting local associations, and acting as one united body in all trade matters. Thirty-seven associations have joined, representing the principal towns in Great Britain, and have appointed as secretary the secretary of the Association. This Association has already experienced the benefit of its alliance with the National Association, especially in connexion with the Painters' Strike.

A Cornish Genius.—Neville Burnard, the Cornish poet and sculptor, has died in the Redruth Union sixty years old, and been interred in a pauper's grave. The *Western Times* says, as a sculptor he possessed great ability and taste, and gave a correct life-like appearance to his works. The bust of the Rev. H. Rogers, late rector of Camborne, in the parish church, and that of the late Dr. George Smith, in the Wesleyan Chapel, in the same town, were chiselled by his skilful hand, and are remarkable for the perfect resemblance they bear to the gentlemen mentioned. As a poet he displayed a deal of thought and satiric witticism, and has enjoyed the company of many literary men of the present age.

Royal Albert Hall.—An exhibition of works of fine art is about to be opened here. A large number of pictures and drawings have been sent in, and a committee of selection has just begun work.——Mendelssohn's "Hymn of Praise" and Rossini's "Stabat Mater" were given with great *éclat* on Thursday, the 12th inst., Mr. Barnby conducting. Madame Sherrington, Miss E. de Fonblanque, Mr. Edward Lloyd, and Mr. R. Hilton were the exponents, with chorus and band numbering 1,000.——Arrangements are being made to illuminate the hall by means of the electric light. It will be an important experiment.

The City Architect, Mr. Horace Jones, was, at the meeting of the Court of Common Council on Thursday, granted four months' leave of absence, on the ground of ill-health.

Decorated Artists.—The following English artists, architects, and sculptors, whose works figured at the Exhibition, have received decorations:—Mr. Millais, Sir F. Leighton, Mr. Barry, Mr. Alma Tadema, and Mr. Gilbert Redgrave have been appointed officers; and Sir John Gilbert, Mr. P. H. Calderon, Mr. J. Arnoux, Mr. W. P. Frith, Mr. J. Collier, Mr. Carl Haag, Mr. Street, Mr. Calder Marshall, and Count d'Epinay have been appointed Knights of the Legion of Honour. In addition to these, about eighty commissioners, jurors, and exhibitors have received different grades of the Legion of Honour.

Mr. Lascelles has received the Cross of Chevalier of the Legion of Honour, by post, from Paris, with a note, signed by M. Waddington, informing him it is for his exhibits in the late Exhibition.

Mr. Forster Graham, of the firm of Jackson & Graham, has received the Cross of the Legion of Honour, the firm having previously received the *Grand Prix* in the furniture classes.

Mr. Joseph Ruston, of the firm of Ruston, Proctor, & Co., of Lincoln, has received from the President of the French Republic the Cross of the Legion of Honour.

A Church Destroyed by Fire.—On Monday morning the parish church of St. Peter's, near Bridgwater, Somerset, which was re-opened on Easter Tuesday by the Bishop of Bath and Wells after undergoing a restoration at an expense of nearly 1,500*l.*, was entirely destroyed by fire. The fire originated in an over-heated flue, which ignited a portion of the roof. In a few hours nothing but the bare walls of the building and the tower remained. The peal of six bells, which were remodelled and rehung last Easter, came down one after another with a crash, and were smashed to pieces. Only the chancel portion of the edifice was insured.

Welbeck Abbey, near Worksop.—The gardens and pleasure-grounds here are so extensive that it would be impossible to see them thoroughly in a day. There are fifty acres of pleasure-grounds. The kitchen-gardens cover an immense area of ground, and produce every kind of fruit and vegetables. A wall 1,200 ft. in length, has been covered with Rendle's patent lean-to glass, to hasten the ripening of the apricots. This arrangement is also used to protect the strawberry beds, on the opposite side of the path, and which are exactly as long as the wall. Most of the fruit is sent away to London, in the form of presents.

The Sewage Question at Rochdale.—To prevent the further pollution of the Roach, and to comply with the provisions of the Rivers Pollution Act, the Rochdale Town Council have instructed Mr. R. Vawser, civil engineer, Manchester, to complete the necessary plans for intercepting and purifying the sewage of the borough. As the works will be very extensive, the plans cannot be got ready for some time.

Mr. and Mrs. German Reed's Entertainment.—On this Saturday, 14th, Mr. Arthur Sketchley will give his last reading of "Mrs. Brown." On Monday next, December 16th, will be produced a "Musical Fairyanza," entitled "Enchantment," written by Arthur Law. "A Tremendous Mystery" still retains its place in the programme, and Mr. Corney Grain, all will be glad to hear, has a new musical sketch in preparation for the Christmas holidays.

Protection of the City from Fire.—The *City Press* states that a plan has been agreed upon between a committee of the Corporation and the Metropolitan Board of Works, to be submitted to the next Court of Common Council, by which it is proposed that the 900 hydrants in the City will be supplemented by thirty-five hose stations, properly manned day and night.

Sunderland.—An application has been made to the Local Government Board for power to borrow 26,000*l.*, for an extension of the drainage system of the borough; and Parliamentary plans have been deposited for the construction of about six miles of tramways by the corporation, the plans for which were prepared under the direction of Mr. Christopher Thwaites, C.E., the borough engineer and surveyor.

Memorial Glass.—The friends of the late Dr. Livingston, the African explorer, will be pleased to hear that a memorial is about to be erected to his memory in Westminster Abbey. With the consent of Dean Stanley it will take the form of a stained-glass window. The commission has been placed in the hands of Mr. W. F. Dixon.

The Artisans' Dwellings Act.—In the House of Commons, on Monday, Mr. Cross, the Home Secretary, in reply to a question by Sir U. Kay-Shuttleworth, promised to arrange with the hon. member for the presentation in a return of information with regard to the towns where an official report under the Artisans and Labourers' Dwellings Act, 1875, had been made, and no action taken upon it.

TENDERS

For erecting two detached corner houses on the Gunnersbury Estate, for Mr. A. Bassano. Mr. Richard Tomlinson, architect. Quantities supplied :—

F. Taylor	£3,520	0	0
Johnstone	3,469	0	0
Niblett	3,273	0	0
Taylor	3,173	0	0
Stephenson	3,121	0	0
Shapley	2,880	0	0
Taylor & Son	2,850	0	0
Parker & Evans	2,800	0	0
Keefe (accepted, subject to alterations)	2,492	0	0

For finishing Bellevue House, Heathfield-gardens, Gunnersbury, for Miss Edwards. Mr. Richard Tomlinson, architect :—

Johnstone	£350	0	0
Ireland (accepted)	270	0	0
Bailey	250	0	0

For the erection of schools and mission-hall, in Sutton-lane, Chiswick, in connexion with Trinity Church, for the Rev. Wm. Frith. Mr. Richard Tomlinson, architect. Quantities supplied :—

Barnes (accepted)	£463	0	0

For finishing detached house in Brandenburgh-road, Chiswick. Mr. Richard Tomlinson, architect. Quantities supplied:—

Johnstone (accepted)	£263	0	0

For shops and residences, Aldershott. Mr. T. Wonnacott, architect :—

Cranston	£7,230	0	0
Mesher	6,576	0	0
Hughes	6,471	0	0
Stephens & Bastow	6,434	0	0
Jones & Co.	6,091	0	0
Kemp	5,518	0	0
Duke & Fowler	5,500	0	0
Garland	5,293	0	0

For two iron cisterns at Rotherhithe. Messrs. H. Saxon Snell & Son, architects :—

Potter & Sons	£546	10	0
May Bros.	535	0	0
Perry & Co.	512	0	0
Berry & Sons	505	0	0
Benham & Sons	501	10	0
Turner & Co. (accepted)	487	0	0

For the erection of nine houses and shop at Hornsey. Mr. Wm. Hussey, architect. No quantities :—

Keefe	£2,941	14	0 !
Niblett	2,634	0	0
Beach Bros.	2,500	0	0
Somerville & Hill	2,490	0	0
Foster	2,469	0	0
Cross	2,450	0	0
Willmott & Sons	2,360	0	0
Taylor & Co.	2,300	0	0
Marriott	2,210	0	0
Riley	2,073	0	0
Ellis & Edmondstone	2,000	0	0
Cousin	1,997	0	0
Waite & Son	1,995	0	0
Hobern	1,960	0	0
Eady	1,950	0	0
Warr	1,890	0	0
Manning	1,850	0	0
Porter & Abrahams	1,800	0	0
Sims	1,797	0	0
Prout	1,775	0	0
Heather	1,632	10	0
Freeman	1,575	0	0 !

For additions to the Lodge at Fisherton Cemetery, Wilts, for the Fisherton Burial Board. Mr. F. Bath, architect :—

Newton	£120	0	0
G. Harris	101	12	6
Kite	95	6	0
Witt	93	8	0
A. Harris (accepted)	80	10	0

For the erection of Board Schools, play-sheds, boundary walls, &c., in Wharf-lane, Shelton, for the Hanley School Board. Mr. W. A. Keates, architect. Quantities supplied :—

Collis	£3,630	0	0
Yoxall & Heath	3,400	0	0
Barlow	3,395	0	0
Redfern	3,325	0	0
Corns	3,250	0	0
Gallimore	3,235	0	0
Jukes & Weston	3,215	0	0
Grosvenor	3,200	0	0
Meadon	3,050	0	0
Emery	2,995	0	0
Clarke	2,940	0	0
Windsor & Co.	2,890	0	0
Ellis	2,870	0	0
Matthews (accepted)	2,698	0	0

For new Temperance Hospital, Hampstead-road. Mr. Barker, architect. Mr. Abbott, surveyor :—

Tarrant & Son	£11,940	0	0
Tyerman	11,872	0	0
Nightingale	11,772	0	0
Brass	11,633	0	0
Nash	11,550	0	0
Langmead & Way	11,500	0	0
Perry	11,465	0	0
Grover	11,450	0	0
Roberts	11,096	0	0
Downs & Co.	10,390	0	0

For alterations, &c., at King-street, Grosvenor-square, for the Earl of Breadalbane. Mr. Beazley, architect. Mr. Mullett, surveyor :—

Knapp & Co.	£1,249	0	0
Tongue	1,131	0	0
Adamson	1,121	0	0
Langmead & Way	1,120	0	0
Nightingale	1,073	0	0
Pope	1,047	0	0

For sundry works in finishing, at Tolmers-square Congregational Schools, Drummond-street, Hampstead-road. Messrs. Tarring & Wilkinson, architects :—

Joiners' Work, &c., in Preparing for Glazing.			
Morley	£195	12	6
Veitch & Close	153	10	0
Anley	185	0	0
Bebington	114	0	0
Glazing.			
Ramsey	127	12	8
Bussell Gibbs & Co.	123	10	0

For the erection of infirmaries, probationary wards, and other works, at the District Schools, Brentwood. Messrs. Lee & Smith, architects. Quantities by Messrs. Linsdell & Giffard :—

Nightingale	£19,657	0	0
Hunt	19,200	0	0
Bangs	18,980	0	0
Sawyer	18,888	0	0
Perry & Co.	18,500	0	0
Greenwood	18,480	0	0
Forrest	18,385	0	0
Goddard	18,164	0	0
Hayworth	17,748	0	0
Smith	17,747	0	0
Beale	16,862	0	0
Jones (accepted)	16,459	0	0

For the erection of a pair of semi-detached houses at Elm-grove, Salisbury, for Mr. S. Curtis. Mr. F. Bath, architect (exclusive of smith, plumber, painter, glazier, gasfitter, and bellhanger's work) :—

Tryhorn	£650	0	0
Sawkins & Mist	550	0	0
Young & Sons (accepted)	480	0	0

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